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**WORLD MARITIME UNIVERSITY**

Malmö, Sweden

**THE DEVELOPMENT OF AN INSTRUCTION  
SYSTEM BASED UPON MULTIPLE SOURCES  
AND TASK RELATED TRAINING SCHEMES:**

**Its Adoption to Effect the Delivery of Relevant  
Maritime Education and Training**

By

**EDGAR ROXAS MARTINEZ**

**Republic of the Philippines**

A dissertation submitted to the World Maritime University in partial  
fulfilment of the requirements for the award of the degree of

**MASTER OF SCIENCE**

in

**MARITIME EDUCATION AND TRAINING  
(Nautical Stream)**

**1996**

## DECLARATION

I certify that all material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The content of the dissertation reflect my own personal views, and are not necessarily endorsed by the university.

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## ABSTRACT

Education and training has a definite role in the preparation for the performance of a professional job. The complementary relationship of education and training is examined in this context. The discussion discloses how the actual practice of the professional work differs from what is taught in the classrooms. This concerns the instruction system, its relevance and timeliness and how effective it is in completing the preparation necessary for the adequate performance of a professional work.

The paper describes the prevailing situation in maritime education and training delivering such instructions specifically at the Philippine Merchant Marine Academy as a representative institution. Several points in the description are true generally in the situation of MET in developing countries.

Competence is judged right in the workplace. The focus of the training concept presented in the paper is the actual performance of a professional work. Applying this concept recognizes a training need. The actual job performance becomes the prescribed student performance and brings the study of the professional work inside the classrooms. A new instruction system accomplishes the task of converting the routines of the actual shipboard work into units of instruction. Instructors need to alternately teach ashore and board ships for a shipboard duty to deliver such new system of instructions and to update themselves and the course topics they will teach. This involves many administrative issues concerning the faculty, implications on hiring and participation of the shipping companies, and crucial implications in the existing academic programs.

Adoption of the new instruction system is further supported by the requirements of the revised Standards of Training, Certification and Watchkeeping 1978 and the implementation of the International Safety Management Code.

Conclusions are formulated in the final chapter with recommendations for the implementation of the whole scheme in maritime schools.

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## CHAPTER I

### General Introduction

It cannot be said more profoundly that the revision of the International Convention on Standards of Training, Certification and Watchkeeping (STCW) was much needed and its overhaul will obligate the government and the private sector of the maritime industry in the Philippines to put up a unified effort to effect compliance with the revised convention. The fact that the Philippines is one of the major suppliers of the world's shipboard workforce will emphasize further the seriousness of the need for a unified effort to comply with the new STCW.

Where would the parallel efforts of both sides be likely to begin? On what grounds will it be supported? What guiding principle is there to follow? More so, what issues to zero in, on which area to concentrate and in what rationale?

The prevailing view on levels of training standards unanimously dictates the basic points in a plain and simple perspective. This perspective is illustrative of the inadequacy of the seafarers from the developing countries to meet the level of standards. These points are fundamental if a well deliberated and rational approach is to be taken to answer the problems of standards of the seafarers' training. Such issues as simulator training and its mandatory use, training facilities and procedures, qualifications of instructors, length of sea training, evaluation and assessment, examinations, etc. The dominant and consistent factors here are the issues of **skills, job performance and competency**. These are linked in sequential order as they were mentioned. Competency results from the application of skills in job performance; the end result and dependent on the outcomes of the other two factors. It draws most of the attention among all concerned sectors in the maritime industry and an item of controversy in most of the written proceedings and views of

seafarers' training. On the other hand, the job performance is entirely dependent on prior skill acquisition.

The equal issues of skills and job performance are determinant of the word competency; the issue constantly in question and the main thing the STCW hopes for the seafaring nations to accomplish. We need to find ways to answer the questions of competency. A methodical way would be to deal with what directly affects it, the job performance. The whole job situation aboard ship is continuously changing, influenced mainly by technology. Skills directly resolve performance and both result in the word competency. The fact that change is as consistent as itself, there has to be something that can cope up with this variable. The most logical point to start a system to cope with change is at the formative stage of the job performance where skills are initially acquired and developed. Where would this formative stage be? The basic answer would be at the maritime schools and training centers.

## **1.1 Background of the Study**

The paper reviews the delivery aspect of Maritime Education and Training specifically the theoretical instruction at the representative institution, the Philippine Merchant Marine Academy (PMMA). It has been initiated due to the global clamor for better standards of competency, with much of the focus being directed to the seafarers of developing countries, the Philippines among them. Emphasis is especially given in this review regarding the current instruction content, its applicability and the instructors' recent (shipboard) experience. These are two separate elements which are related to each other causing a collaborating effect on the total significance of "relevance and timeliness" of Maritime Education and Training.

If we look back to re-initiate the whole learning process and focus on its outcome, that is the ideal learning outcome, the whole system can be organized to work backwards and let the ideal learning outcomes prescribe the means of its

achievement. The learning outcomes are the result of learning process. It can be seen in the job performance synonymous with competency and the means refer to the methods used to achieve such result. It is a must that this process be designed as practicable and according to the prevailing situation and resources of the country. This is one of the benchmarks of the scheme being formulated in this study. An instruction scheme where the ideal job performance prescribes the pattern and procedure for its practice. Practical application of this would be at the education and training stage. The study will follow a reverse sequence then in developing the scheme.

Significant information affecting the formulation of this concept such as the comparison of the instructions in the on going curriculum and the instructions in the model instruction unit will be used. It is the actual practical job areas developed into to an instruction system that will be correlated with the theoretical academic instructions. The results of such comparison will focus on the learning/ training outcomes of the model instruction unit developed from actual practical job areas on board if the same learning/ training outcomes is achieved by the instructions in the main curriculum. Whether there is a correlation, near correlation and even no correlation at all will be evaluated and discussed in the paper. This will provide the grounds for the examination of the procedure and content of actual theoretical instruction, sources, references, training process, aids and materials. Is it relevant to the actual job performance after the completion of the course? Is it timely and serving to impart the standard knowledge in the shipboard job performance? Does it introduce the actual situations on board or develop the necessary skills involved in actual practice of the profession? All these will be taken up and a concept developed at the end which will merge these significant aspects. The topic intends to formulate an instruction system patterned from *multiple sources and training schemes out of tasks (functions)*.

## **1.2 Purpose of the Study**

The pace by which technology has advanced and is used aboard ship contributed substantially in lessening the relevance and timeliness of Maritime Education and Training in the developing countries notably the shoreside. This is for the simple reason that MET has not kept in step with change identified with technology. It is in the context of relevance and timeliness that the whole study aims to contribute to the whole Maritime Education and Training system in the Philippines. This is by way of an instruction scheme based on several sources of functional and practical rationale. The specific and relevant job areas aboard ship within this rationale will be identified and correlated with the classroom theoretical instructions. Relevance is thus added to the whole theoretical process plus the incorporation of actual job routines as exercises to reinforce the previous theoretical event. The issue of "relevance and timeliness" is self-evident at this point. The whole educational experience is brought as near as practicable to the actual job practice and current situation on board. This is what this study mainly intends to accomplish. Admittedly, the extensive use of the shipboard experience of instructors will play a major role in this scheme. This need in turn will require a much desired program for the faculty answering both the concerns of employment (shipboard and ashore), continuous license update, and career advancement aboard ship and ashore. There are specific administrative functions that will be improved along the process such as hiring procedure, rank distribution within the faculty and lastly the issue of financial compensation for the faculty. These are consequential to the accomplishment of the main objectives and hence secondary and supportive.

Lastly, the study hopes to present a groundwork for the initiation of efforts calling for the participation of the government and the shipping companies in the program for hiring and employment of active merchant marine officers; to make teaching a part of their career development and a permanent job assignment ashore alternating with sea duty.

The whole system will provide the initial step towards the execution of a genuine and much needed effort from the government to improve and allocate assistance to Maritime Education and Training. It will call hopefully for the cooperation of government and the shipping companies to provide the necessary support for this scheme and likewise the program it entails for the faculty which will deliver this in MET institutions. This topic is most relevant especially to a country like the Philippines being one of the major suppliers of seafarers to the world's merchant marine fleet. Furthermore, the revision of the International Convention on the Standards of Training, Certification and Watchkeeping 1978 (STCW) shows the topic to be timely as the contracting parties will be obligated to document their efforts to comply with the Convention. Maritime Education and Training is one area that the Philippine government needs to give attention to first before a genuine documentation can be made.

### **1.3 Scope and Limitations**

The paper intends to examine the current professional practice of a merchant marine officer's work aboard ocean going vessels. This will include mainly the actual functions recognized from common and standard practice of such work routine covering both the officer of the watch in the deck department and as a duty engineer in the engine room. The prevailing delineation and assignment of functions, task and responsibilities corresponding to ranks aboard likewise will be covered. The professional side will consist of the aforementioned plus the contributory effects of the varying work environments (which essentially dictates work routine) and the obvious effects of trade routes and ship types. It is in these officers' work areas where all observations will be pursued concerning possible content of a prescribed academic instructions. This will definitely provide relevance to the development of the instruction scheme. The significance of each of the individual aspects of the task, i.e. the chores assigned according to rank aboard, to the whole actual job execution

will be included in the analysis. The other side of the investigation will involve the present academic instructions at the representative institution (PMMA).<sup>10</sup> It will cover the theoretical content, the actual methods/aids used in the instruction, and the faculty performing such instruction. The purview now ranges from the professional practice that is actually onboard to the shore based stage that is the education and training.

The model instruction scheme presented in the paper is developed from the functional job area aboard ship. It specifically concentrated on the work function of the secondmate, i.e. voyage planning which is the shipboard experience of the author. The limitation of the the single work function developed into an instruction unit will not affect the purpose and objective of the paper. A job analysis accomplished by a panel of merchant marine officers is recommended in the last chapter to develop instruction units similar to the one presented in the paper.

#### **1.4 Relevance to the Field of Study**

Education and Training in general are two separate but interrelated disciplines which, however defined will prove effective to each if the correct recipe for their combination is used. The same is true in Maritime Education and Training. It is reflected in every design and development of schemes and courses all aiming to today's prime issue of competence. The paper basically focusses on the same aspect of education and training and the equal treatment of each towards the maximum achievement of competence after completion of a prescribed course. The revision of the International Convention on Standards of Training, Certification and Watchkeeping plus the introduction of the International Safety Management Code both establish the grounds for administrations to embark on means to improve the maritime education and training. Instruction schemes perform a significant function in the process of education and training specifically in the delivery aspect. It is here

where the paper reflects much of the relevance in the topic it desires to study; the pedagogical means to achieve relevance in education training ashore and achieve job competence aboard ship. The formulated concept has positive implications for planning, organization and administration of MET. The whole instruction scheme encourages new instruction procedures and task oriented training schemes with a fair consideration on the basic traditional knowledge requirements.

### **1.5 Nature and Order of Presentation**

The paper is presented as a reactive response to the question of competency and skills, the two main demonstrative characteristics of job performance influenced by the different factors in the process of education and training. The whole process of discourse is carried out towards the creation of a solution that will improve the administration and employment of the technical faculty and at the same time fulfill the main objective of dealing with the achievement of relevant training outcomes advocated in the revised STCW published by the International Shipping Federation (ISF) as a guide for the shipping industry. The concept is developed from the current state of education and training at the Philippine Merchant Marine Academy as the leading MET institution in the Philippines.

Initial discussion will include the subject of education and training in a general sense and continues further with a separate view of the role of each to the other. This is followed by an emphasis on training as an indispensable routine where a substantial improvement needs to be made in relation to the nature and professional practice of shipboard work. It further cites the concern of carrying out sufficient and effective training through the adoption of more practical on the job work routine as student activity.

The introduction of the maritime significance of MET and the concept of preparation follows as the paper pursues a more specific view of education and training. This leads to the issues of adequacy of such preparation, knowledge



requirements, and the role of the learning environment. This segment then develops an explanation of perceived components of the latter and resolves the effects to the achievement of relevant learning in MET institutions. The world trend and developments in MET are examined, followed by the current situational account of the MET in the home country and institution of the author. The issues raised in this part will be later used to direct the attention of the readers to the passive state of MET at PMMA and to point out the merits of the concept proposed in the paper.

Chapter two discusses the difference between the education and training and its complementary relation to achieve a complete learning and preparation. It includes the developments in MET and the recognition of a training need to answer the prevailing question of competency. The situation of the MET in the representative institution is also taken up and points out the area to focus in the curriculum if relevance and a regular update is maintained.

Chapter three devotes an ample length of discussion concerning the onboard practice of seafaring as a profession and in the later part the recognized functions of the shipboard work and tasks under each. A contrast is presented between on one hand the maritime education and training creating a pattern for the practice of the profession of seafaring and on the other hand, this time the practice of the profession prescribing the corresponding pattern of instruction in education and training. This is discussed in chapter four. The latter will be supported by the comparison of the instruction procedure and content of the main curriculum and the model instruction unit. Conclusions arrived at in the analysis will form the basis for the development of the pattern of instructions in MET; the proposed concept advocated in the paper. Chapter five will present the model instructional scheme and discuss the rationale, progression, instruction planning and implications in the whole MET set-up. These will cause changes in faculty administration as a consequential effect. This concerns the human resource implication and is dealt with in chapter six. Adoption of the new instruction scheme will entail new hiring procedures, involvement of the shipping companies, salary adjustments, faculty rank distribution and experience, allocation of

teaching load and faculty upgrading. The vital point of applicability and timeliness will integrate the effects of the implications to establish urgency for the government and the private sector to put up a cooperative effort and implement the proposed concept of the paper. The discussion will also draw attention on the impact of the revision of the International Convention on Standards of Training, Certification and Watchkeeping, 1978 on maritime education and training in particular. The last chapter will solely contain the conclusions reached by the author and instructive guidelines for the representative MET institution and recommendations for the maritime administration of the government.

## CHAPTER 2

### Education and Training

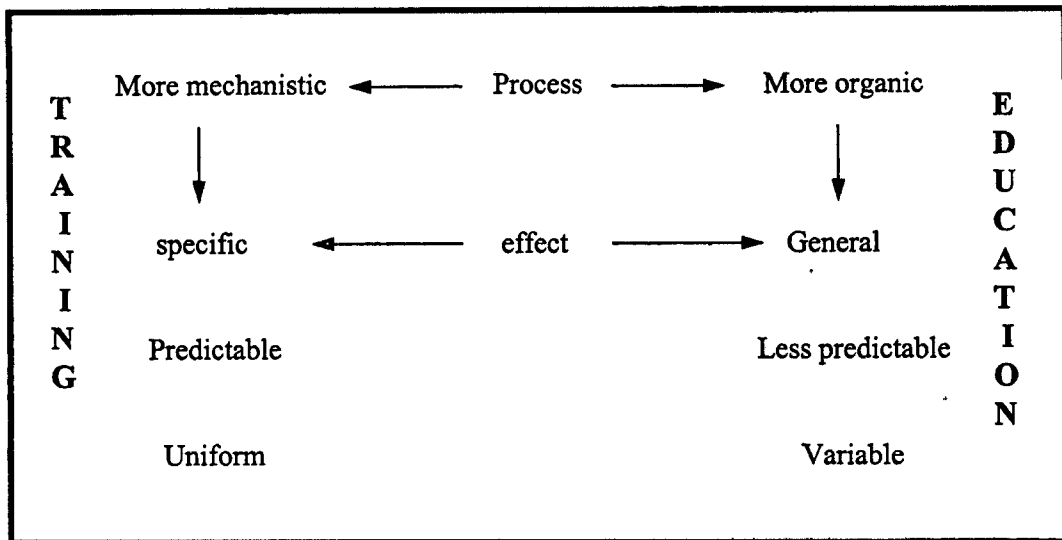
Education is the process by which knowledge and ideas are imparted to an individual or group of individuals resulting in awareness and understanding of facts. It is synonymous with learning which is the immediate consequence of education delivered specifically via precise and definite procedure towards achieving a particular goal. This can be seen socially as a transformation of an individual into maturity and adulthood. Academically the same event of learning is achieved by education. The outcome of both is growth and development resulting from the inputs of his environment including the people within. This transformation takes place in an academic environment; one of the twin concerns that will be pursued in this chapter.

Almost all of the activities characterizing education are involved more with academic study. This close association is evident as whenever education is referred to, the idea of academics comes in. All the work that involves formal study in an institution theoretically undertaken identifies the role of academics in education. It serves as a medium through which education is delivered, building the *theoretical know-how* and the *theoretical reasoning* that serves as the foundation for succeeding learning activities. This is the theoretical side of learning and only forms part of the whole learning process.

Seafaring is one among many professions that is neither considered a blue collar job nor a white collar one. It belongs to both of these contrasting categories considering the range of work from an apprentice mate or an ordinary seaman up to the position of a master mariner. It encompasses all kinds of job routines as the mariner's role undergoes a changeover along the way from a deckhand to an officer.

mariner's role undergoes a changeover along the way from a deckhand to an officer. In the conduct of the work aboard that involves the manual or menial segment or even the supervision of people performing such type of work, what component of the foundation studies he acquired from education can be of relevant use at this stage? The mariner has to have that segment of the studies in an institution of learning that focuses on the applications and provides an opportunity for practical execution of all theoretical undertakings. This leads to training, the other concern in this chapter.

The manual tasks performed in any kind of professional job cannot be fully learned by an enthusiastic student and effectively described by any pedagogic method without actual or near actual hands-on experience of the learner. The student must receive equal inputs of theoretical and practical instructions to complete his learning environment. This will permit exposure to the experience and situation of the actual job task. The theoretical input is provided academically and balanced by the actual performance of practical routine. The latter serves as an activity which exposes the whole process of a task's execution, its procedure, methods used and its significance. It lays down the mechanistic, i.e. activity oriented, environment of a lesson designed to involve the learner's participation and actual execution of tasks. This is the function of training. The word "mechanistic" as used by Buckey and Caple (1990) suggests most appropriately the idea of motion and activity it requires for theoretically learned knowledge to be developed into skill through practice, exercise and repetition. Figure 2.1 clearly illustrates the difference between education and training. The educative process likewise leads to the development of skill but through theoretical means. This is a gradual progress of development and change; the student's cognitive faculties are mostly at the receiving end of instructions. The absence of action is obvious and this is what sets it in perfect contrast with training. The author desires to initially relate to the process as the other points completing the distinction will be taken up as the paper proceeds in its discussion.



Source: The Theory and Practice  
of Training, p.15

Figure 2.1

### The distinction between education and training expressed in terms of process and effect

## 2.1 Training: A Complement of Education and Vice-versa

The “action learning” (Fricker, 1989, p.9) phase becomes an essential part of the whole delivery process of instruction. Academically provided instructions from this point can be distinguished from instructions extemporaneously given to the student as the task is performed.

Education identifies itself more academically and its practical execution accomplished through training. Learning in a maritime sense can be achieved academically or by immediate exposure on the job. Pursued separately, learning the theoretical side alone or performing the initial practice of the job without the necessary theoretical background does not fulfill the complete preparation which the seafaring profession requires. Training serves as an aftermath to the pre-delivered instructions; a necessary stage in a chronological sequence of the learning process. Maritime training in its own continuous progression tends to be end specific.

Maritime training in its own continuous progression tends to be end specific. Education for most curricula set-up serves to comply to national regulations, that is the academic requirements of the whole course. Theoretical instructions accomplishes most of these. Training on the other hand answers the objectives established particular or specific to the work trade or job capacity being developed in the program. It needs to be undertaken in a cooperative effort towards learning.

The maritime profession on board consists of many technical and physical routine and it is only through the conduct of effective training that complete learning can be achieved. It is indispensable to the totality of the system of instructions. It needs to complement the theoretical instructions if the aim is to achieve total preparation.

## **2.2 Maritime Context of Education and Training**

The practice of every professional job requires preparation accomplished through education and training. The maritime profession, that is the shipboard work or to be more definite the seafaring job also requires such preparation. The EDUCATION AND TRAINING needs to be oriented in an environment almost identical to the work situation on board and subsequently organized according to the job routine of the professional practice in order to fulfill the desired purpose of the preparation. The adequacy of the preparation must be such that maximum knowledge is absorbed by students and themselves immersed in an environment almost similar shipboard work situation. The maritime context in its truest meaning must consistently be used in all aspects and phases of learning be it within the confines of the classrooms or in the field for practical exercises. The environment itself is the base of every maritime aspect of education and training in all of its context. It is the space where the ideas, situations, events, information or the whole knowledge and concept is delivered to the student by instruction. Aside from the fundamental role of the environment, there are necessary ingredients assisting in the

fulfillment of relevant learning. As mentioned earlier, the basic learning venue is the classroom, field or laboratory. The classroom must be so equipped with what the lessons require. It has to have facilities which can efficiently assist the clear infusion of knowledge, in short assists in teaching and also the practical involvement of students, the hands on phase to perform task and develop skills. These ingredients are physical factors that must be considered. The other equally significant part concerns the staff fulfilling the role of teaching. The degree of influence they exert to effect learning is determined by their qualification and experience specific to the field they are engaged in. Both the physical factors of the venue and those pertaining to the teaching staff all relate to the maritime environment in an MET institution. The education in context must include both of these factors to fully understand the maritime sense of the whole context of MET.

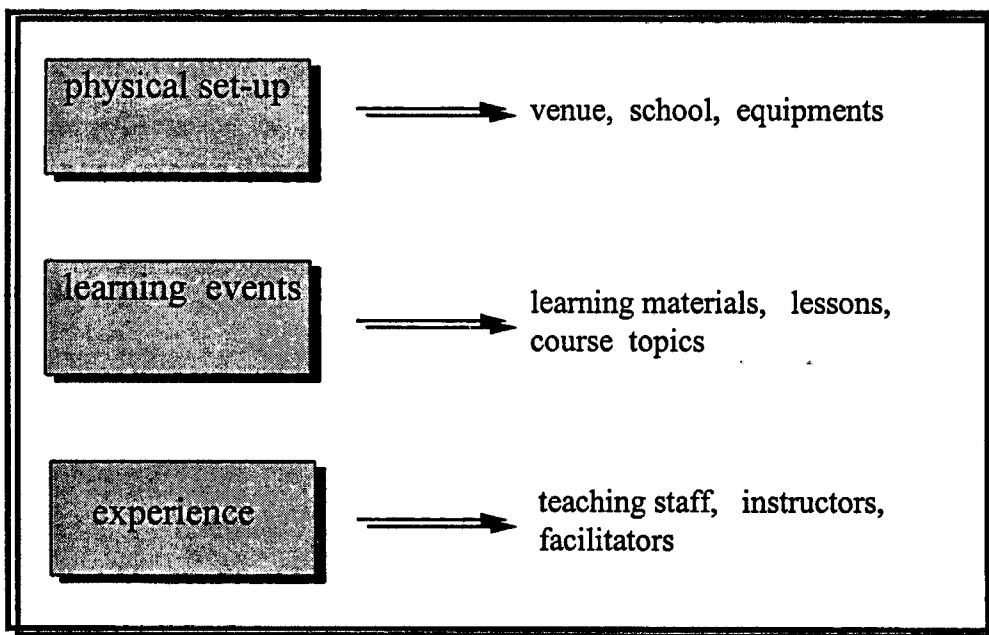


figure 2.2

### The Learning Environment

Each of the three must make its own contributory effect if the maritime context serves its purpose of identifying the education and training which will achieve relevance in its delivery.

### **2.3 Maritime Education Today and Developments**

Maritime Education and Training has progressed much from being considered of lesser stature than other common college courses. This impression stems from view of the work aboard ship as more of a manual effort and not within the reputation of familiar white collar jobs. Hence the education and training it requires was merely vocational in nature as compared to the same requirements of degree courses in popular universities. Though this impression still remains, it has gone past this stage today; the nautical course is widely accepted as an equal to other courses awarding bachelor of science degrees. It has evolved from a simple vocational type course to a formally organized program of maritime study following a well defined and specific curricula. This resulted in a more professional practice of work and a definite procedure for qualification and rank progression through licensure examinations comparable with the practices in other courses.

The work environment greatly affects the perception and judgment whether the corresponding education and training for a particular profession measures up to the actual and expected job performance. It is the issue of education and training conforming with the requirements of the present practice of the professional work which pushed forth and generated the necessary changes in MET. This is a significant angle where one can view a great part of where and how developments evolved. The processes and procedures involved in the issue of the practice of professional work, the whole shipboard work environment; how to reflect them in the classrooms are the focus of these developments. Ships have increased in size affecting design and different types of ships emerged with new equipment. The use



of such equipment introduced changes in work operations consequently affected job practices and procedures. The same job practices and procedures several years back which the education and training is still teaching today. The problem is very obvious at this point. The education and training is not advancing and adjusting to the pace by which the professional work has changed. This is attributed to the constant and continuous use and application of technology in the work environment. The discrepancy between the pace of technology application in work practice and adjustment in MET increases as the former accelerates steadily while the latter is sluggish and at times on a standstill. This situation is generally evident in the maritime education and training of the developing countries and the reverse is true with the technologically advanced maritime nations. Many countries in the developing world are either starting or in the process of developing and re-organizing their own MET systems. The former is evidenced by a struggle that still exists about a year and a half ago to incorporate maritime education into the existing educational system; a situation that is true mostly in non-traditional maritime countries. (LSM 1994, p. 37). Hiring and employment has shifted away from countries where MET is well developed. In the other countries, where hiring and employment is concentrated, MET has much to be desired and needs more effort to invoke response not from institutions themselves but from the administration. From this point it is readily discernible where the developments have been initiated and the direction it will pursue based on the available resources, present needs and current trends. The basis this time holds true for both the developed and developing maritime nations.

The pursuit of education and training is generally apparent in two areas. One is in the regular undergraduate program and the other in the higher education or continuing education for maritime professionals. The efforts in the latter are concentrated on providing additional academic qualifications to mostly shore based professionals, the greater number has prior shipboard experience. The knowledge gained from the continuing education proved to be of significant use to the maritime professional ashore and his work practice. The higher degrees earned serve as

additional employment qualifications and a means for people with no shipboard or similar experience to gain eligibility for a position in a maritime related work ashore. Programmed courses leading to a postgraduate degree have been more established and advanced in developed countries. The undergraduate program experienced most of the shifts and modifications effected mainly by technology, the most real patent application of which is automation. This affects manning, shipboard organization and work re-distribution all of which result in crew reduction; an expected consequence. All of these are the distinct elements which establish the work environment aboardship. It is essentially how the mariner performs his job within the work environment that measures the adequacy and effectiveness of education and training he acquired before. This brings us back to the issue of discrepancy between work performance and MET.

### **2.31 Actual Job Performance: A Measure of Competency**

Today the mariner's "preparation" explained in 2.2 is continuously undergoing "*modification*" and the resulting "job roles" performing the "*shifts*". This is true for the two types of training systems prevailing today. The MET of the traditional system needs to undergo more modifications in response to the changing job roles due to the application of technology in the work place. The extent and degree of modifications in MET and job role adjustment is less in the integrated or dual license training systems. But nevertheless, job performance competency of a traditional and an integrated/dual licensed officer is still measured convincingly on the job.

The thrust of MET today is the achievement of competency through training using modern equipment and computers. The inclusion of management training in integrated training schemes has enhanced professional capabilities as management tasks are brought onboard, widened the job opportunities ashore and most

importantly eradicated the impression of seafarers being considered as just “mere ship drivers” (Slade, *Seaways*, 1995, p.12). All these aim to improve crew performance in general for whatever specific objectives a company has. This issue is just a more tangible demonstration of competency ultimately falling back to MET as the doer. *But still competency is better proven on the job.*

The completion of a course in an educational institution does not guarantee competent performance within the field of work. What it commonly achieves is knowledge competency with the cognitive skill. Training undergone within the course determines significantly the extent of performance skill gained which facilitates demonstration of actual skill in job execution. Training ideally accomplishes this, but it often falls short of this assumption in most situations. The eventual situation would be that competency is proven on the job; the actual understudy to the job position fulfilling the hands-on experience and direct execution of tasks. This is aided by able guidance from senior officers, constant work observations and on the job situation analysis of the individual himself. This event takes place in the actual work environment itself and nothing more can be said to describe its effectivity in developing competency. This practice is true for students of all training systems; the traditional and the dual or integrated systems. The graduates themselves need to be coached, mentored and guided and most importantly need to have the job experience of actual work situation. The competency reflected on the job i.e. the actual job performance differs considerably to the competency stipulated on the license. The achievement of competency and license is never achieved at the same time. The license is often obtained first but it is never a guarantee that the position can be immediately and competently assumed. The acceptance of such job position is often decided only after such time that the job routine is practiced as competency needs to be measured on the job.

### **2.32 Job Performance as Classroom Performance: Establishing a New Training Need**

MET needs to answer questions in performance competency; the foundation of its practice is built from the delivery of MET itself. **MET has to re-create the effectiveness of the competency groomed and developed aboardship, the efficiency of mentoring and coaching and on the job task execution.**

The job performance that is the shipboard job performance is identical to the performance concerns of Human Resource Development (HRD) programs in personnel development. The HRD is familiar to most as a department within a business company. The MET institution can be seen as the HRD similarly concentrating on personnel performance or rather student performance; a most applicable term. The HRD this time is not just a department within but the central organization itself. The MET as the HRD directing training efforts to emphasize on performance. The training goal is the shipboard job performance and to attain the performance prescribed by the professional practice, student performances are consistently monitored and adjusted. Classroom tasks performed by students and learning situations used must be identical to actual tasks and job situations prevailing onboard. This concept should be adopted in establishing the training goals of an MET institution that are relevant, specific and up to date.

There exists a situation when there is nothing wrong with the skills and knowledge of the personnel. They are all cognizant and well aware of the need of these on the job. But the training conducted due to poor performance evaluation did not achieve positive results. What made the difference was making the job procedure systematic and simplified. It is clear from this situation that performances on the job are not reflecting the expected application of skill and knowledge (Brinkerhoff, 1987, p. 125). The scenario in MET is viewed in similar context. The cognitive skills and knowledge provided by education remained cognitive and trainers failed to give attention to ways by which the students can effectively execute the practical

applications of the cognitive knowledge and skills previously acquired. This failed to assist in the recognition of the work practice and its professional execution. Re-training with the same method as before will not remedy the inadequacy of performance. But the *orientation and description of the expected job performance will achieve positive performance results.*

Robinson and Robinson in 1989 pointed out the need to identify in particular the purpose of the conduct of training to the organization. Not just the broad purpose but the detailed objectives and distinct goals of the training and its significance to the task of the trainees. Purposes must be set out as objectives and goals of each training activity. The need to be specific in training process is essential in MET. Purposes tend to project the broad side of intentions of training whereas objectives and goals provide concrete learning order and definite direction. In most situations, the generality of education prevails and left without the needed complimentary role of training, that is the role of focusing education.

Learning can be achieved as the goal pre-set by the design of means and procedures used for its attainment (Warries, 1990, p.3). Learning is used here in a general sense, but it can be specific to a particular job area to introduce the training function. The means and procedures constitute the instruction system; its design and mainly the concept can be developed such that it directs learning of a prescribed and specific student performance. This is what the fundamental design and concept of the **instruction system** aims to accomplish in the paper.

Crew performances and shipboard performance are consistently the subject of concern whenever standards and competency are questioned. Such performance is the product of the previously acquired education and training. If the job-related performance is selected and prescribed as student performance and from them the corresponding instruction system is developed, then we are going back 34 years ago to what Glaser advocated:

“when end products of learning can be specified in terms of particular instances of student performances, the instructional procedures can be designed to directly train and build in these behaviour.”

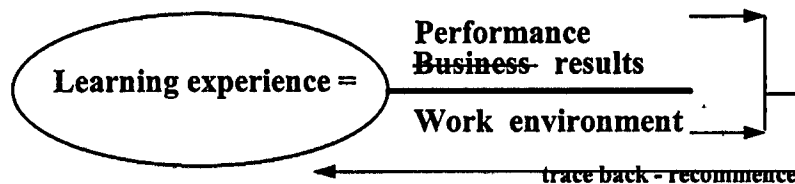
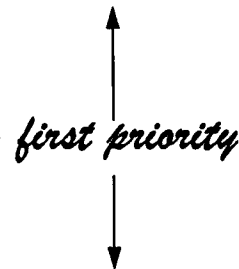
In these situations, the job performance becomes the student performance within the four walls of the classroom and the specific instruction system designed from the actual job routines on board. From the standpoint of this concept, the work proceeds backwards and allows the job performance to identify the practical skills necessary for the execution of the professional work. The cognitive skills and knowledge will be sorted out as it is used and applied according to the requirement of the identified

A. H R D Results oriented training concept

Learning experience X Work environment = **Business results**

B. M E T

Learning experience X Work environment = ~~Business~~ **Performance results**



Source: The Training for Impact Approach, p. 11

(modified)

figure 2.3

The MET Concept

practical skill. The scheme will enable both the trainees and the trainer and or the instruction designer to recognize the training need. It can also be seen from an HRD perspective in figure 2.2. The concerns of an HRD are business results being the product of the learning experiences of the training programs; the skills learned supported by the work environment. None of the quantities on the left hand side of the equation is zero or not contributing to the desired result otherwise the product will be zero. This explains the multiplicative relationship. The basis of the concept was used by Robinson and Robinson (1989) in their description of a results-oriented training.

The same approach can be used with an MET institution. Performance results are substituted for business results in the HRD equation both given equal priority in the two organizations. The MET equation is altered so as to allow the desired performance results supported by the work environment prescribe for the corresponding and required learning experiences for its attainment. This approach becomes a necessary process to re-commence the training with a most relevant learning experience. This is the result of the direction followed by the concept where the actual and ideal job performance prescribes the requirements for its achievement. The instruction must be designed to fulfill the teaching requirements of the identified practical skills of the professional work. These requirements are essentially according to the functions of the work and order of execution; according to respective ranks and positions of personnel performing such work on board. The development and learning of practical skills are given emphasis and priority. This definitely demands training rather than a repetition of knowledge acquisition through theoretical instructions. The scheme recognized the "training need"; the term used by Sheal (1989) in the job performance and in his work he identified "performance discrepancy or deficiency as a training need." Working from this point and tracing the route backwards clearly exposes the gap between the MET and the job practice. This is the main fault in the conduct and delivery of MET affecting the work practice and supporting the grounds for questions raised against competency.

## **2.4 MARITIME EDUCATION AND TRAINING in the Philippines**

The system and structure of MET in the Philippines has consistently been a part of dissertation topics dealing with the maritime industry in the Philippines. The same description and explanation in its entirety still holds true especially the basic process and structure. The paper will mainly concern itself with the components of the MET system in the Philippines which directly affects the instruction and consequently influences the learning goal of the whole MET effort. This will be dealt with sequentially in the following topics. Generally the process of delivery and the contents of instruction can be briefly described as traditional. Delivery directly involves the instructors, and instruction contents are the requirements of the learning goal. In these times the traditional things are fast becoming outdated. This is very evident in the practice of the maritime profession at sea and the maritime field as a whole. This is caused by the consistent and widespread use of technology in the place of work that education and training should find ways to adjust its instructions with the same consistency as the changes are introduced in the job practice. Although equal use of technology will greatly update the delivery aspect of MET, the use of training equipment and simulators thereby affecting training methods, practices and instruction content will not completely accomplish relevance and desired competency requirements of the learning /performance goals. The MET in the Philippines needs programs with operational procedures to effect relevance and produce competency oriented results of its learning goals. This should cover not only the teaching side but equally address the management and administration of the faculty.

### **2.4.1 MET in the representative institution - PMMA**

The general description of MET in the Philippines as traditional reflects more of the private MET institutions. The PMMA as the only government



maritime school fits in the same description, but more efforts have been exerted by its faculty to move away from the traditional methods.

The main problem of maritime education and training at PMMA is the uncertain supply of faculty members. It is the prevalent issue in maritime education and training which directly affects its delivery. This results in the inability of College of Marine Transportation and the College of Marine Engineering to select the best instructors and devise selection schemes. High standards reasonably accompany competitive salaries and compensation in a practical view. The academy cannot attract the best and afford to put a rigid testing and evaluation scheme if in the first place the salaries are not competitive. Guidelines in load distribution and hiring with respect to ranks of instructors are ineffective if the supply of teaching personnel is scarce. Apart from this is the task of how to make the instruction relevant and timely and how to make the whole education and training focus on skills and competency. A program must be initiated to correct these deficiencies and that will greatly affect the introduction of innovations in methods of instructions in MET.

#### **2.4.2 Delivery of Maritime Education and Training**

The quality of Maritime Education at PMMA has been considered better than that at the other maritime schools elsewhere in the country. This was and still is due mainly to the instructors who can be considered as those belonging to the upper bracket of seamen professionally performing well in their shipboard assignments. The majority of them were fresh from shipboard duties when they came to PMMA to teach which is a rarity in private maritime schools. This explains why there is always that updated touch in the manner by which the instructors teach although the same theories are used as foundation.

### **2.4.2.1 Curriculum and Curriculum Content**

The curriculum follows the pattern set out in the IMO Model Course, United States Merchant Marine Academy and the guidelines from the Department of Education and Culture. It has been revised once at the time of Commodore Gil Fernandez to keep it updated. Since then, the College of Marine Transportation and the College of Marine Engineering have been initiating instruction variations with the instructors to keep the classroom education reflect the actual work practice on board. This has been an effective classroom practice but unfortunately not continuously implemented as the instructors come and go. Although the effectiveness in instruction is evident it is not implemented long enough. The irregularity of teaching assignment of the instructors accounts for this deficiency and it is one of the issues which this paper aims to answer.

### **2.4.2.2 Training Aids and Equipments and Methods of Instruction**

The Academy uses equipment to aid the instruction in both colleges. Two rooms are arranged and set up similar to that of a bridge with charts and plotting instruments to serve as a laboratory where midshipmen can work by themselves or perform chartroom tasks in a class. Several electronic navigational instruments in one of these rooms can be used for practice and study purposes. Two computer based simulators the Poseidon and the Navitrainer are both used in the College of Marine Transportation. The former is used in Radar Simulator Course, ARPA Course and in Radar Observer's Course as an important instruction aid. These courses are offered both to the midshipmen and as upgrading courses for officers from other shipping companies. The latter is for bridge watchkeeping instructions and watchkeeping simulations, collision regulations familiarization, practice and simulations. The audio visual rooms is a venue for all maritime related films which

serve to augment the classroom instruction and practical lessons given to all midshipmen.

The equipments are all being utilized to facilitate instruction and as a separate medium to deliver education and to provide training. This is done aside from the traditional classroom teaching routine where most of the theoretical instructions are given.

### **2.4.3 The Faculty Profile**

The present faculty of the Philippine Merchant Marine Academy is composed of graduates who either have chosen to pursue a shore career in teaching or those who have just completed shipboard work assignments and are willing to spend sometime to teach and share the knowledge and experience they have acquired on board. As mentioned, the list of the faculty in the College of Marine Transportation and the College of Marine Engineering is seldom complete. This is due to the fact that the majority of the instructors are active merchant marine officers who are regularly boarding ocean going ships and there is always a need to go back to sea as the salary as an instructor proves inadequate.

All faculty members in both colleges are licensed deck officers and marine engineers. They have all been aboard all kinds of commercial ships on international routes under most flags of big European and Asian principals. Several of them are taking a post-graduate course in Maritime Education and Training at PMMA and most of the senior positions in both colleges are occupied by graduates who had completed a post graduate course in Maritime Education and Training at the World Maritime University. Short term training courses have also been attended by a number of its faculty members in Japan.

### **2.4.3.1 Selection/ Hiring/ Employment procedure**

The Philippine Merchant Marine Academy is the only government maritime education and training institution. It is therefore governed by the Civil Service Regulations concerning employment and the positions with the corresponding wage scale bracket. Policies on standard qualifications for state universities and colleges apply to the PMMA as it is a state university, the same policy that apply to government owned and controlled corporations, bureaus and agencies of national and local government.

Hiring of faculty members is governed by the Recruitment and appointment policies and procedures contained in Merit Promotion Plan of the academy. License and academic requirements exist in rank designations of all existing faculty positions. Merchant Marine Officers must have used and practiced at least with the third mate's or fourth engineer's license for at least three years before being accepted for a faculty position. At present there are no guidelines regarding the rank selection and composition of the faculty by ranks. The uncertain supply of instructors caused this shortcoming and both colleges likewise have not been able to exercise the authority to be selective to incoming instructors due to the same reason.

Wages as mentioned are governed by the wage scale corresponding to the positions prescribed by the National Compensation Circular provided by the Department of Budget Management. This is the same with all government agencies and controlled corporations and state universities.

Selected members of the faculty in both colleges have been attending upgrading courses when available. The training courses in the respective technical field (nautical and marine engineering) range from specific courses to instructor training as an upgrading course for officers and/or instructors. The PMMA has been sending faculty members from the two colleges to the World Maritime University. This has substantially updated the faculty by the transfer of knowledge from the WMU graduates. The exposure to maritime education and training is a necessary

event which affects the process of MET in the home institution, the PMMA. Most of the senior positions are occupied by faculty members who have graduated from WMU. The post graduate course in Maritime Education and Training from this university is a recognized advantage for the faculty. The academy is continuously sending participants to benefit from the scholarship programs of the university.

## **2.5 The Curriculum defined as practiced**

From the very first occasion a course is conceived, concern is initially focused on its structure and framework. The arrangement and organization of the subject matter or topics included in the intended study are manipulated in the curriculum after which the intended study becomes an organized course. Knowledge requirements are grouped into topics which are then categorized into subjects making up the whole course. The pre-set learning order determines the sequential presentation of the subjects towards the completion of the course and the attainment of the intended learned state of the branch of knowledge of the course. Curriculum most often is defined through the description of its content. The effective definition would just be the specification of the knowledge area of proficiency for which the whole curricular program was tailored for; what the learner would have become or the profession he will engage in afterwards. The nature of this definition provides the end result or the learning goal of the curriculum but will not serve the purpose of measuring its effectiveness in achieving its goal. How the final learning goal was achieved or how short was it from achieving the final goal are questions which entail the analysis of how the curriculum was implemented. This is the actual application, the means, methods and procedure of its use or how it is actually put into practice; its execution ( Huses, T; Postlethwaite, NT; 1985, p.1162). These pertain substantially to instructional side of application; the whole pedagogical resource. The curriculum content is a significant criteria but

the greater indication of the effective achievement of its goal resides more on the means of applications.

## **2.6 The Need for re-definition**

Re-tracing the whole pedagogical execution and the resources used will describe adequately the curriculum application. The whole conduct of the course conforming with the curriculum short of achieving its goal is just another course for the purpose of undertaking it. It remains a routine or a chore to perform. This is the apparent situation in most MET institutions. The course contents are valid, clearly complying with the standard guidelines. What limits the achievement of the final goal is the inadequacy of the application itself. It obscures the purpose of the activities and task prescribed by the course and lessens the relevance of the whole course and the learning experiences possible with an effective pedagogical execution.

## **2.7 The Area to Concentrate**

Most of the curriculum in MET among the developing countries follows the guidelines set out by IMO. This refers totally to the content. National education policies and requirements have to be complied with aside from the guidelines of the IMO Model Courses. This makes the curriculum fixed and would require a research supported evaluation before actual alterations to the prevailing curriculum are permitted. This will take a considerable time plus the long and tedious bureaucratic process that procedure will undergo. Relevance and up-to-dateness of the curriculum must be maintained with its implementation. Considering how the actual practice of the maritime profession is changing, it will require frequent alterations of the curriculum set up to maintain relevance and currency. Curriculum set-up then need not be altered if it complies adequately with IMO and national regulations. The

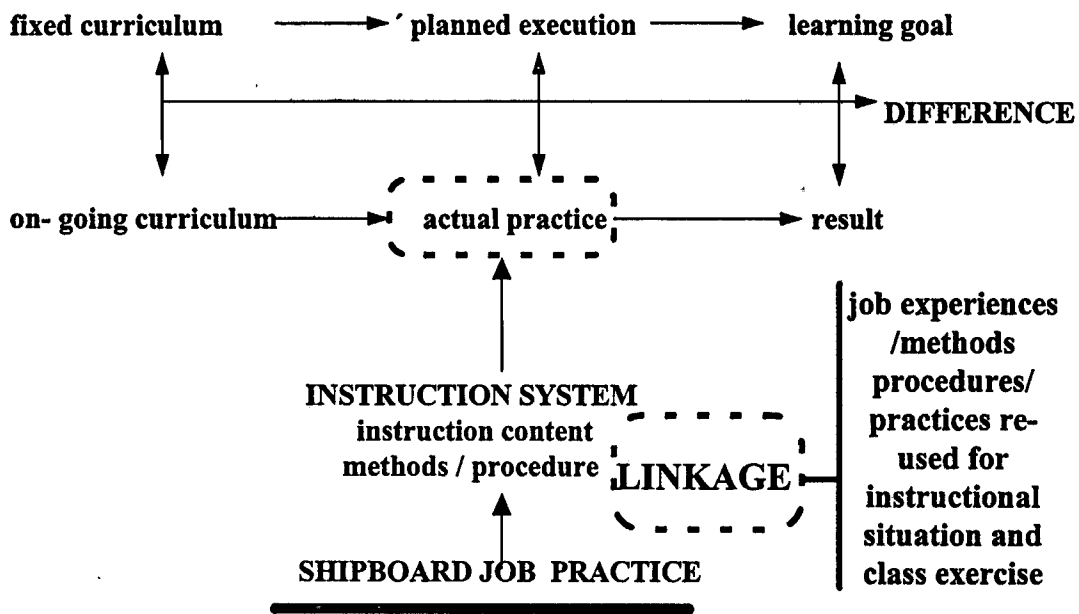


figure 2.3

**The Area to Concentrate**

instructors will play an important role in this scheme. Their experience on the job will facilitate the effectiveness of the delivery of the instruction and the creation and correct presentation of instruction contents. The execution of this instruction scheme will require actual equipment and publications as instruction materials which contribute substantially to the relevance and up to dateness of instruction content.

The curriculum needs an adaptable linkage or system (see figure 2.4) that can be frequently changed and reoriented to prevailing job practice and at the same time keeping a relevant connection with the on going curriculum.

## **CHAPTER 3**

### **The Practice of the Maritime Profession**

#### **3.1 The Diverse Role of the Mariner**

A nautical student after completing the required length of studies in college will find employment aboardship to start the practice of his chosen profession. The initial job assignments are usually in the lowest level in the hierarchy of work position and rank aboardship. This is how the typical work practice or employment normally begins for a fresh graduate of a B.Sc. degree in nautical or marine engineering inclusive of a year of apprenticeship training. Although the completed course is for officers, a fresh graduate starts his work practice in this process. The initial position and all succeeding positions are all in his line of work. He either assumes all work positions in a regular progressive order or jumps one rank or two due to promotion. This is not uncommon until he reaches the entrance position of his intended line of practice. For a deck officer the intended line of practice is an officer's position as a mate. The third mate is the entrance position. The fourth marine engineer is the entrance position for the engineering practice.

The whole work set-up and organization on board consists of different job positions in different work roles. The career of a seafarer at sea, specifically that of a merchant marine officer, does not start at the entrance position of his intended line of practice. He needs to go through the regular process of work employment and assume various positions. This is due mainly to two reasons:

- The preparation he underwent did not achieve the adequate and relevant training outcomes required to actually perform the job.  
( a training issue)



- The prevailing process of employment proves the best way for a seafarer to reach his intended job position. (an employment issue)

The mariner consequently performs varied work tasks dictated by the work role of the different positions he assumed. As a general consequence, the work exposure has provided the mariner with diverse experiences, aiding him best in his past job positions, the same situation holding true for future positions as he continues his job practice.

In summary, a seafarer learns most of the work and functions of each position on the job rather than being taught in school. Often MET has failed to identify the intended job role (the entrance position) and equip students to effectively perform the work tasks and functions involved. This could have been done by introducing experiences in the line of work which help in the performance of the functions in the line of practice (an officer's position after completing a B.Sc. degree in nautical or marine engineering). The seafarer is only introduced to such work experiences by the time he starts to work aboardship. The position he assumes is never the officer's position. He needs to understudy this position first before he can actually perform the work and functions involved. He has to work his way up through the ranks; encounter job experiences that provide confidence and which will assist him before the actual performance of the position he intends to assume.

### **3.2 The Routine of Shipboard Work**

The established shipboard work routine concerns the regular operation of the ship in its trade. This is grouped generally as follows:

- manoeuvring/docking
  - maintenance/deck work
  - cargo operation
  - navigation
  - maintenance/ engine
  - engineering
- /undocking

The different work roles referred to in 3.1 fall in these six general groups. Each job position has a definite corresponding work role. Work is established and organized according to the requirements of the situation of the work routine above. Each job position has a different work role in the work set-up and organization. Whatever work preparation these six ship operations need, however organized as to the required number of officer or crew, **tasks make up the whole work routine.** It is the “**on the job execution**” of these tasks that enables the seafarer to gain diverse experiences from the various positions he occupies. Work exposure should lead to task performance; the rational explanation of the employment issue previously raised. The preference of seafarers themselves to progress step by step through the regular process of employment came about as a natural reaction to the inadequacy of training. It is a remedial step; an alternative way to get employed in the line of work and allow the individual to understudy the intended job position eventually assuming it at the end. This is the seafarer’s or employee’s side. Again, MET’s role needs no further clarification. The critical implication is the same as that pointed out in 3.1. Two important questions are directed to MET in response to the training issue developed in the preceding discussion. *How can the training areas covered by the prevailing instruction system be specifically identified? What are the contents of this instruction system and its sources that will identify job roles?* The following sections will elaborate further the points raised in the present discussion and describe more specifically the practice of shipboard work.

### **3.3 The Crew**

The crew performs the manual and physically demanding chores aboardship as the term deckhand suggests. These chores require skills and such work assignments require trained and experienced personnel. Their preparation for shipboard work requires applied practical training rather than theory and academic

schooling. The most advantageous way to reach a mate's/engineer's rank is by assuming a rating's position. It is also the most prevalent and common process being followed as it provides the needed basic first hand training and knowledge of crew's work before efficiently and effectively leading them in the same work routine once a mate's/ engineer's position is assumed. Previous work experience as a crew member moreover will provide a better understanding of the work involved and the actions of the crew members as viewed now from an officer's perspective in terms of decision making, planning and directing ship operations. Another factor is the confidence of the officer in himself and the confidence in and respect for him from his subordinates i.e. the crew. From a training and education perspective, it is a "must" to have had this experience to complete the training and education of an aspiring officer/ engineer. The learning experience gained from the exposure to the crew's work can be developed to provide the same learning experience inside the classroom as a pedagogical tool equally involving the practical situation. The diversity of the job roles experienced on the job at the start of the seamen's career at sea must be formally introduced to him through instructions using actual situations on board as training situations. It must form part of the job preparation ashore; the best foundation for a higher position involving planning, directing and decision making in the same line of occupation.

### **3.4 The Master and Officers**

The master is part of the complement of the ship's officers. Together with the chief mate they are the senior officers on board among the four officers with the second and the third mate as the junior officers.

The entrance position to this line of occupation as the ship's officer is the third mate. Each has its own particular job assignment and duty from the basic work of standing on bridgewatch. Initially employed as a third mate, promotion to the next rank requires a period of sea duty and a licensure examination. This situation is

true until he reaches the rank of a captain, as the shipmaster. But the question is how does the MET prepare students to become officers? European MET provides a sound system of preparation of their officers as the education and training is broken down into segments and focuses on that particular position/rank of intended next employment. The representative institution, PMMA provides the MET for officers in a continuous length of schooling. Emphasis is given to the objective of how to become and qualify as an officer of the deck watch or engine watch. The job preparation for the succeeding ranks (second mate, chief mate and master's position) is acquired through onboard work practice.

### **3.5 The Ship and Its Trade Route**

The work environment is dependent mainly on the type of ship and is considerably affected by its trade route. The ship type determines much of the work situation on board and consequently affects the work set up and organization. The work routine of the officers and crew of a tanker ship is different from that of container, general cargo or a bulk carrier. Different ship types and trade routes affect the work environment in the following areas :

- safety precautions / procedures
- watch /work organization for officers and crew
- watch composition officers / crew
- maintenance work
- cargo operation

It is in these aspects of work where ship type commonly affects the ship operation and management. The work of a chief mate as the cargo officer in a chemical tanker for instance differs to a great extent from the work of a cargo officer in a general cargo vessel. Although the same principles of stability and trim are used, the work routines are different. There are chemical ships where the chief mate does

not stand on bridge watch and goes on a day work routine. The company then hires two third mates to complete the watch arrangement on the bridge. In the event that the second mate assumes an understudy role to the chief mate, the job of the navigating officer is assigned to one of the third mates. These are just two of the many situations where the ship type with its trade route affects ship work organization and management altering job roles and functions. How could a third officer who finished a traditional nautical course perform such functions of a navigating officer (second mate) as in the situation previously cited if in the first place the MET he completed only prepared him as a basic officer of the watch? This situation points out the deficiency of MET in two ways. First, it is evident here that the MET did not adjust to the changing work environment which affected the work operations and eventually job roles and functions. Secondly, the largely knowledge based basic skills acquired from the traditional MET are inadequate to perform the more specific job functions e.g. the second mate. MET falls short in providing adequate preparation for the various roles demanded by the profession.

### **3.6 Delineation of Functions**

The respective work routine must be examined in terms of functions from which the tasks are identified. Each task as identified can be grouped in order of execution and under the function where it is required. This provides more relevance and system in the recognition of various skills introduced and a definite concept and perception imparted to students as to when and how the particular previously learned skill and knowledge is used. This allows the relevant knowledge and skills to be most easily applied to the particular work situation. Then it becomes an iterative process that greatly helps students to achieve competency. Directing learning by prescribing the learning experience itself results in a process that relies less on the predictable and general effects of education (consult figure 2.0 ) and more on the predictable effect of practical training.

### **3.61 The Officer of the Watch**

The officer of the watch (OOW) is one of the three certificated deck officers (also includes dual licensed officers) under the master who stand a bridgewatch during navigation and in other situations when an officer's presence is required on the bridge. This is the initial job role on which all the education and training preparations are focused. The fundamental knowledge and practice of navigation make up the greater part of the acquired skill which is mostly knowledge-based. A host of other similarly acquired knowledge e.g. seamanship, stability and trim, meteorology supports the job performance of an OOW. The traditional MET at PMMA as the representative institution, mainly aims to produce graduates capable and qualified to stand as an OOW ( also explained in the second paragraph in section 3.4 ). The full length of study in an MET institution provides the minimum knowledge of the functions and work routine of the other ranks of a deck officer. The education and training largely covers the job practice of an OOW. A graduate only has an idea of the work functions of the other ranks of a deck officer on board. This comes from the broad knowledge he acquires which is obviously inadequate to actually and efficiently perform the work routine of the other ranks. The student is merely oriented to the job practice of a second mate, chief mate and master. This does not suggest that the MET should aim at educating and training graduates who right after graduation are able and qualified to serve in all positions in all ranks. The author believes this is efficiently and effectively accomplished on board through experience with mentoring or coaching from senior officers. What is pointed out is the inadequacy of the preparation of students in the MET institution ashore for the job roles of the other ranks. Preparation should be such that the next job practice of the next higher rank will not be entirely new to the incoming officer intending to assume such position. The officer can better adjust to the situation in section 3.5 (shift of job role) and the job preparation will not be solely dependent on the experience acquired along the work practice. The full length of the course

in the traditional MET ( nautical course in the representative institution, PMMA) will compliment the on the job preparation for the succeeding ranks and fully cover the education and training of deck officer, not just an OOW.

### **3.7 The Tasks Supporting Each Function**

The recognized function in the typical work routine cannot be effectively described and efficiently taught unless the job function itself as it is performed in the work situation is developed into a learning experience. This can only be done by identifying the task involved, developing this as the instruction itself. The instruction content consists of the whole work situation taken in the class; each event, the task involved and the job practice.

What implications does this have for MET? Again following the initial process of delineation of work functions, task identification furthermore nullifies the general effect of education and introduces the "specifics" of the learning experience in training.

## **CHAPTER 4**

### **Maritime Education and Training Patterns for the Practice of the Maritime Profession**

#### **4.1 The Theoretical Foundation**

Theories make up the basic material of the curriculum. They establish the fundamental principles of a subject in a course until such time that the practical application specific to that subject is carried out. The same is true with a college course. The content of the whole course curricula enumerated in its syllabi consists of theories to set up the principles. These are the principles of the job profession the course aims to teach. Theoretically, the learning process starts this way until such time that the learned theories are adequate to support its practical application.

#### **4.2 The Theory in Practice**

Theories remain the same and the curricula founded from these theories likewise remain unchanged. The individual application of theoretical principles does not change as for instance the theoretical principle of how the sextant is used for position fixing. But the use of this specific application as part of the whole position fixing system on board today is not the same as before. The original application of its theory remains the same but its use with respect to what is available today changes because of the modifications in the professional practice. The principle involved in obtaining the day's run by the navigating officer is still the same. A second mate performing this work routine in the old practice measures directly on the



chart. On the other hand a second mate today takes advantage of the Satellite Navigator to measure this for him. This is a situation where the principle still holds true, what differs is how it is applied today in the prevailing work practice. These are two clear shifts of relevance in the work practice.

- use of the entire theory in practice
- change in the practical application

#### **4.2.1 Objectives and Areas Covered**

The objectives for which the whole curriculum was designed for do not undergo a similar relevant transformation. It is fixed and retrogressive. The attainment of the original learning objectives may not be relevant or significant to the actual practice of the profession today. The same is true with the learning areas or activities as these are determined by the objectives themselves. In MET, the training activity reflects the relevance as the training objective sets the activity required for its attainment. If the training objectives remain the same and do not respond to change, they can be described as fixed and inflexible, thus directing the entire training effort in a conclusive pattern that is irrelevant and outdated. Seen against today's changes in work practice the objectives are relatively retrogressive as viewed by an external observer in comparison with prevailing professional practice and present work environment set-up aboardship

The inflexibility of the objectives limits the extent to which they can prescribe training activities. If the objectives do not adjust to reflect the goals of the current professional practice then the practical skills (or training outcomes from The Revised STCW Convention by the International Shipping Federation, 1995 ) developed from the training activity will not be relevant to the prevailing professional practice.

### **4.3 The Shipboard Training Phase**

The whole length of education and training phase on board exposes the student to the actual work environment. It is an important and indispensable segment of MET as all of the knowledge previously learned is applied on the job. Ideally, this is what the shipboard training phase should accomplish. Its training involves the actual work activity in actual work environment and in real time. These are the three main factors making shipboard training experience a vital part of the whole MET; a critical determinant of the total effectiveness of its delivery. Part of the total effectiveness of the delivery of MET is initially shown by reviewing the segment of education and training before the shipboard training phase and assessing how it fundamentally prepares the students to undergo the next learning stage. This will reveal how vital the pre-sea education and training time is to the whole shipboard training.

### **4.4 Exposure to Shipboard Work Areas**

Shipboard training presents the whole work operation, the ship as the work environment itself. The exposure may come to the students in two ways depending on how the previous process of education and training was conducted allowing the student to proceed to the next higher learning stage. First, the exposure serves just as an actual demonstration of how the different work routine is done or how a particular job tasks is performed on board. It serves as an experience where students can confirm the effectiveness of previously learned work theories, methods and procedures. This time the student himself is involved with the actual work situation, actually engaged in the work operation. The involvement proves to the student himself the use of all the previous education he has acquired. Secondly, exposure presents everything on board as entirely new or different from the previous education experience. The work situation may not come as an entirely new subject but the difference from what was taken up previously (in class during pre-sea education and

training) will present something new to the student. An inquiring and inquisitive apprentice mate will consistently investigate the applicability of the previous lessons he has had. There is a need to find out where and when this method applies or if this argument or theory holds true. The shipboard training of most traditional MET fits in to the second type of exposure. Most often the difference of the job procedure as performed on board from what was previously taught in the classroom ashore amounts to such that the whole job procedure is entirely new. The student finds himself learning a new job procedure. This holds true for all work operations on board.

#### **4.5 The Distinct Work Functions**

Within the work areas are functions performed by the ship's personnel. The recognition of the work functions in all work areas is important in an apprenticeship training program. It provides an actual job distribution among the officers and crew. This pertains to the responsibility, specific work duty, and the assigned job routine for each rank and position onboard. The shipboard training presents the whole work organization onboard and the functional work distribution in actual ship operation. The distinct job functions are learned as they are encountered on board. This is also true with the functional job practices of officers. Again as discussed in the previous section there are job practices which have been taken up in the pre-sea education and training but usually performed in a different procedure on board and many work functions in all work areas are only encountered by students on board for the first time.

#### **4.6 Analysis of Pre-sea Education and Training Phase**

Apprentice mates and engineers today train on board modern commercial ships of all types. They encounter and experience work operations on board which

could have been adequately taken up in the pre-sea education and training ashore. Most of the job tasks are either performed in a different procedure in actual situation or are entirely new to the student on board. This is especially true with the work tasks of officers. Today the pre-sea education and training apparently is not at the same level of relevance as compared to the next stage of learning that is the shipboard training. The previous discussion concerning the theoretical foundation and objectives covered dictating the learning activities in the curriculum and explains adequately the difference in the level of relevance between the pre-sea education and training and the apprenticeship training aboard ship.

The shipboard training need not be a separate segment of MET. It is a stage of development in the whole process of MET which the pre-sea education and training ashore should prepare for.

#### **4.7 The Actual Practice of the Maritime Profession Creating a Pattern for Maritime Education and Training**

The practice of the maritime profession was described in chapter three focusing on how the practice followed a trend of employment as a consequence of the deficiency of the MET. The job functions and roles were actually learned on board. The actual practice and experience gained in the work onboard helps achieved competence in the job. This is before the actual performance of the job. The important role and function of supervised shipboard training, understudy and coaching practice and the assumption of different work positions on board are all part of the whole effective learning system of a future merchant marine officer. This is an on board learning system patterned after the actual practice of the job itself. The same effectiveness and efficiency can also be accomplished ashore. MET needs to copy the same system based more on competency and move away from its present system mostly based on knowledge.

## 4.8 The Resulting Scheme of Instructions

The approach suggested in the previous section requires a new design of the prevailing instruction system. The objective of the paper in redesigning the whole instruction system which is the curriculum itself ( as discussed in 2.7 ) does not involve extensive alterations. It merely recognizes the work and job performance pattern on board and uses it as guide to design an independent instruction unit. This will accomplish the following when developed into a separate **instruction unit according to the shipboard work routine and shipboard rank and position organization:**

1. distinguish work routine as training areas
2. identify job roles and functions
3. specify work tasks into main task and sub-task
4. organize learning into tasks

At the same time the instruction unit will carry out four important functions in providing the on going curriculum with direction towards training.

<b>1</b>	update the prevailing curriculum as to the new professional work practice	<b>3</b>	provide training tasks/ application for the knowledge skills.
<b>2</b>	sort out the general knowledge skill imparted by the prevailing curriculum into its specific use in a particular job role /function.	<b>4</b>	provide an actual or on the job work situation as training activity and regular lesson examples taken in class.

The unit will also update the curriculum and its contents, materials, lesson situation, examples and lectures on the present work environment on board and **adapt to changes in work practice.**

### **4.8.1 Identification of Relevant Functional Job Areas**

The whole instruction system basically develops from a training area directly related to the professional work competency that the curriculum aims to achieve. It is essentially a shipboard work routine or operation ( as explained in 3.2) consisting of several work routines or operations specific to a job role. The shipboard work routine or operation is referred to as the training area for the purpose of the development of the instruction system. Identification of the training area is the first stage in the development of the instruction system (see figure 4.5) The eight training areas illustrated in figure 4.4 are as follows:

- |  |  |
|--|--|
| <b>1. NAVIGATION</b>                               | <b>5. ENGINEERING INC. ELECTRONICS</b>                     |
| <b>2. CARGO HANDLING &amp; OPERATIONS</b>          | <b>6. RADIO COMMUNICATIONS</b>                             |
| <b>3. MANEUVERING DOCKING/<br/>UNDOCKING</b>       | <b>7. MANAGEMENT &amp; COMMUNICATIONS</b>                  |
| <b>4. MAINTENANCE &amp; REPAIR<br/>DECK/ENGINE</b> | <b>8. SHIP SAFETY - MANEUVERS AND<br/>EMERGENCY DRILLS</b> |

The job area is then identified within the selected training area. Its functional characteristic pertains to the role, duty, responsibility and purpose of the job position in a given work routine or operation. This also includes the work processes and procedures of the identified job position within a job area. This is the second stage in the development pattern of the instruction system as described in figure 4.5. Figure 4.1 is part of the whole set-up illustrated in figure 4.5. The training area in the model instruction system is Navigation; the functional job area voyage planning; second mate is the functional job position. The third stage is the formulation of objectives and the fourth stage is the specification of learning activity or tasking.

Attention is given to several important points related to the model instruction scheme illustrated above. First, the second step, that is the analysis of the functional job area, needs to be completed by a group of officers or engineers who has actually served in their professional capacity the rank and job assignment in

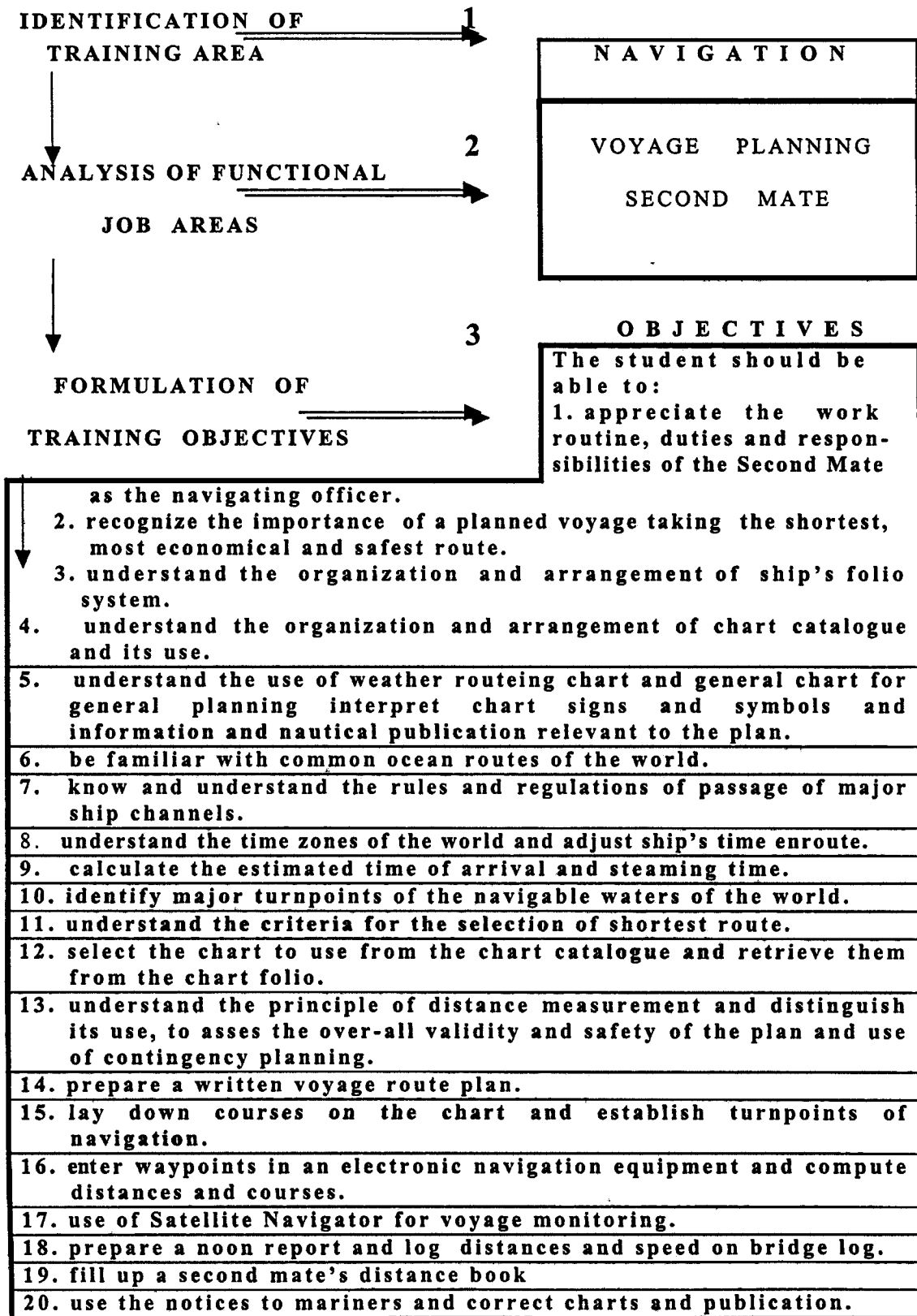


figure 4.1

The Instruction Scheme Development and Set-up

the identified training area e.g. second mate as navigating officer, chief mate as the cargo officer. This is in itself a job analysis where resource persons create an instruction system from the collection of their experiences in the actual professional work environment. Second, the objectives are actually the step by step procedure on how to carry such functional work routine. The objective itself will identify the tasks or learning tasks to be performed by students in the class. It is evident here that only those individuals (deck officers or engineers) who have really assumed such functional work on board will be able to effectively outline the learning objectives hence the learning activity necessary for the instruction scheme. Third, the identification of the sources of the instruction (the materials to use in carrying out the instruction) will follow as illustrated in figure 4.3. The contents of the instruction system need not always be a functional job role within a job area. The instruction topic can also be related to the work operation within the identified job area such as:

**The Ship Under Pilot**

**Personnel Management & Human  
Relations**

**Bridge Procedures**

**GMDSS & VHF Communications**

**Maritime English**

The identification of the job role in a shipboard work routine or operation (the training area in the instruction system) and the development of it as instruction material will provide a thorough and updated understanding of how a particular work is done practically on board in actual situation. An instruction unit similar to the model presented here (figures 4.1-4.2) can also be designed as an upgrading course. This can be presented to both active merchant marine officers and undergraduates. (see appendix 1 )

#### **4.8.2 The Recognition of Actual Tasks**

The analysis of the job role as accomplished above is an outline of the necessary tasks under the identified job role. These tasks are the standard and actual



**SPECIFICATION OF  
LEARNING ACTIVITY  
T A S K I N G**

4

	T A S K S		corresponding Topics in the MAIN CURRICULUM	
	Preliminary Tasks		subject	r e m a r k s
1. Define and explain the duties and responsibilities of a second mate as the navigating officer.			SEA* 101**	-taken in class but not specifically demonstrated.
2. Identify and describe the functional tasks of a second mate.				-not taken in particular to the functional task of a navigating officer.
3. Explain the importance of a planned route and justify its selection from the aspect of safety, distance and economy.				
<b>MAIN TASKS:</b>				
1. Locate port of departure and port of destination using a small scale chart for general planning.				-no specific practical execution.
2. Initially trace the voyage route on a general chart and estimate the total distance, times zones of the port of departure and destination and time zones which will be crossed along the way.			NAV 102	-no specific practical execution. ***
3. Select charts from the chart catalogue.			NAV 101/301	
4. Retrieve charts from the ship's chart folio and arrange them according to the order of use.			not taken	-no practical execution.
5. Inspect all charts to be used and if charts for approaches and port are available and of appropriate scale and still of valid edition.			not taken	-no practical execution
6. Select and establish the most appropriate turnpoints of navigation of the safest route and record on the voyage plan. a) plan a passage in a major navigable channel b) plan a whole voyage from berth to berth.			not taken	*** (a) is taken theoretically; no practical execution.

*figure 4.2*  
(continued on next page)

**The Functional instruction Unit compared with the  
corresponding Topics in the main Curriculum**

\* technical subject as Seamanship (SEA), Navigation (NAV)

\*\* stands for 1st semester of the first year (101), 2nd semester of the first year (102), 2nd semester of the third year (302)

\*\*\* taken in general but not specific to the purpose of functional shipboard work/ tasks (only taken theoretically as a general knowledge)

7. Calculate the distance and courses, steaming time and estimated time of arrival. a) by manual calculations b) by electronic calculators	NAV 101/301	***
8.. Plot the courses and waypoints and adjust if necessary.	NAV 101/301	***
9. Prepare a final written voyage route plan.	not taken	
10. Review nautical information from publications, routing information and mark when necessary affected charts. e.g. radio reporting point, passing distance, information concerning nav. aids.	NAV 101/301	*** Rules of passage in major channels and straits, routing information not specifically taken / no specific practical execution.
11. Obtain a noon position and prepare a noon report and log distances/speed for the day on the bridge log.	not taken	
12. Fill up the second mate's distance book.	not taken	
13. Correct charts and publications with the notices to mariners.	NAV 101	-only the chart corrections / no practical execution
14. Demonstrate the use of the Satellite Navigator :		-principles of operation and systems taken
a) To calculate distances and courses between waypoints and the total distance for the whole voyage.	not taken	
b) To calculate estimated time of arrival at each leg of the voyage.	not taken	
c) To monitor voyage progress and the distance run.	not taken	

*figure 4.2*      **The Functional Instruction Unit compared with the Corresponding Topics in the Main Curriculum**  
( continued from page 47 )

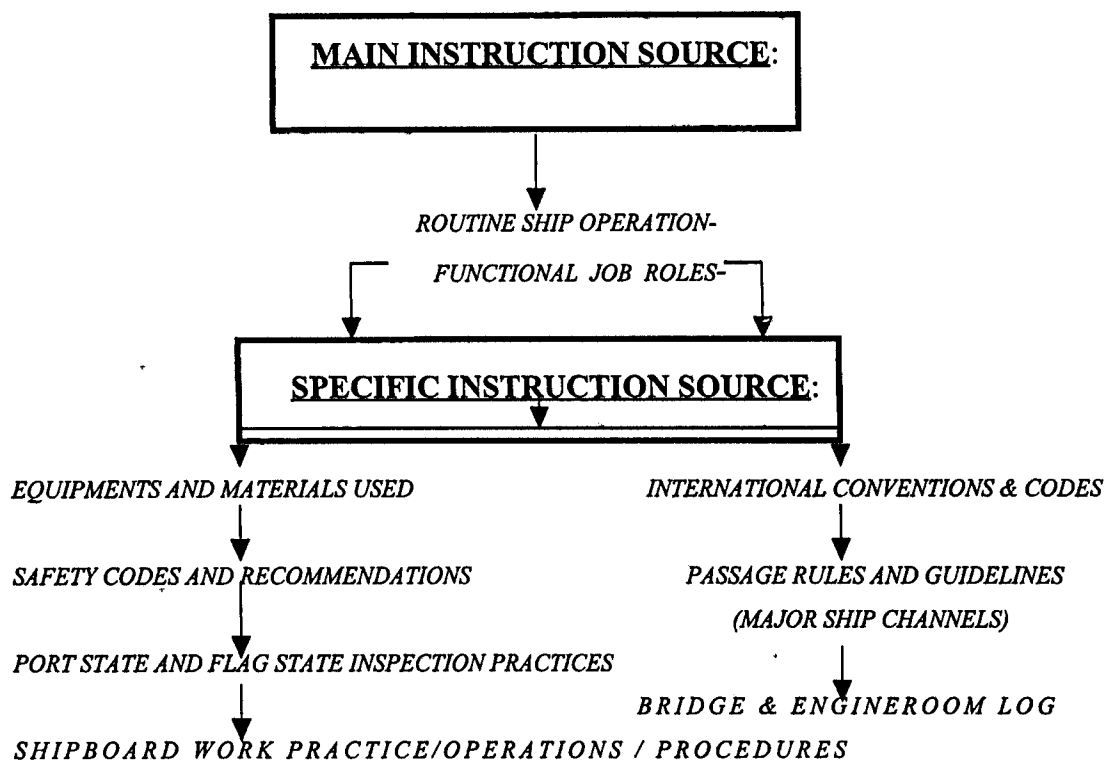
chores or work routine performed by the officer or rating assigned to this particular job according to the work organization. The tasks as recognized by the course designer from the actual practice will enable the objectives of the instruction system to be formulated and the learning activity specified.

The comparison between the corresponding topics in the main curriculum and the identified tasks (figure 4.2), reveals how the preparation (study process in the main curriculum) lacks in practical scope what it should equip students to fully perform the tasks of an officer (second mate in the example) after finishing the prescribed length of study in school. The author would like to remind the readers that the representative institution, PMMA prepares its graduates to basically become third officers. The succeeding ranks and positions are assumed only after licensure examinations and none of the additional schooling specific to each succeeding rank. Several tasks in the proposed instruction scheme are not actually taken and if some have been covered in the main curriculum, they have usually been taken in pure theoretical procedure and mostly without actual practical execution. This accounts for the use and value of mentoring and coaching very much prevalent aboardship before the actual assumption of a new rank and position. The adoption of the instruction scheme brings the advantage of this prevalent procedure in the classrooms and links the gaps between the actual work practice and what is being taught in school and a continuous updating scheme for the main curriculum.

#### **4.8.3 The Multiple Sources of the Instruction System**

The whole instruction system, its development and delivery is principled on the "use of actual work routine." The use of textbook situations and examples in class exercises and discussions is still valid and not ruled out by this new system of instructions. This practice is still necessary as theoretical principles are better understood using theoretical textbook situations. The purpose of creating an instruction system guided using the actual job routines as instruction topics is mainly

to introduce towards the later part of the delivery of the on going curriculum the actual job practice on board. This will identify the correct job assignments to a particular position and find the specific use and application of knowledge skills in practical work. The practical work is the task and if the actual work situation is used, the correct sequence of execution, the procedure, and the methods can be taught and performed by students in class. This instruction procedure designates the job performance as the student performance inside the classroom as discussed in 2.32. The whole instruction system developed in this principle directly effects relevance to the training process. Substantially contributing to this effect are the sources from which the instruction system is based. Figure 4.5 (C) identifies these sources in the design of the instruction system. The following are the description of the perceived sources from where the instruction system is developed.



**Figure 4.3 Materials and Sources of Instructions**

#### **4.9 The Instructor Experience Requirement**

Achieving relevance in the instruction system itself using the actual work situation on board and the functional job tasks as learning activities are just half of the whole requirement of the instruction system proposed in this paper. The instructor teaching the work situation and functional tasks must have performed such work and tasks himself in his professional capacity. Experience of the instructor will greatly determine his effectiveness and efficiency as a mentor and his capacity to coach students on the performance of actual job functions. The instructor performs the basic pedagogical procedure in his teaching routine throughout the course. He must possess the basic skills in lecturing similar to those required from non-maritime instructors, such skills as explaining, presenting information, generating interest and lecture preparation identified by Brown and Atkins, 1988. But again these are the basics. Granting that any two instructors possess the same skills and apply these skills in the same degree of efficiency in the same lecture topic, the difference will readily be seen in the effectiveness of the application of the skills. The instruction system consists mostly of work procedures, processes, and sequences. These are in the actual work practice. Clearly, the instructor with the actual experience of the work on board will be more effective in carrying out these teaching assignments. Efficiency and effectiveness are two different things. Pedagogical procedures from textbooks can teach the former; the latter is best acquired through experience. This is just half of the instructor's tasks in the whole instruction system intending to impart more to the students the applications to the actual work rather than teaching the fundamentals involving theories and principles. The instructor has to focus more on how to develop the actual work, its procedures, processes and situations into a material that can be used in instructions. The instructor has to have at his disposal a wide knowledge of the whole work; the tasks and functions. Experience is the best source of these and likewise indispensable in dealing with problems and difficulties students might encounter in the classroom execution of the professional work. The

task of instructing is performed to a minimum. The greater amount of time is devoted to coaching similar to the shipboard practice. This requires more than just the knowledge of how the work is done. Coaching demands from the instructor the actual performance of the work or tasks itself. This is the same as requiring him to have assumed in his professional capacity the rank and position to which the functional work or task is delegated and being taught in the classroom. An individual cannot identify and recognize the weaknesses in the performance of such professional work and effectively devise exercises and remedial measures to supplement the students learning routine if he has not performed the work himself professionally. Without such actual work performance he can do this only to a certain extent and this would only be confined to textbook recommendations and advice.

This requirement for instructors has several important implications for the administration of the maritime faculty specifically in the representative institution, the PMMA. Furthermore, this requirement is in direct compliance with the Code A Section a-1/6 4.1 of the Revised Standards of Training, Certification and Watchkeeping; a vital step which the implementation of the instruction scheme will accomplish for the MET at PMMA. A further discussion will be pursued in chapter six.

# SHIPBOARD WORK ROUTINE

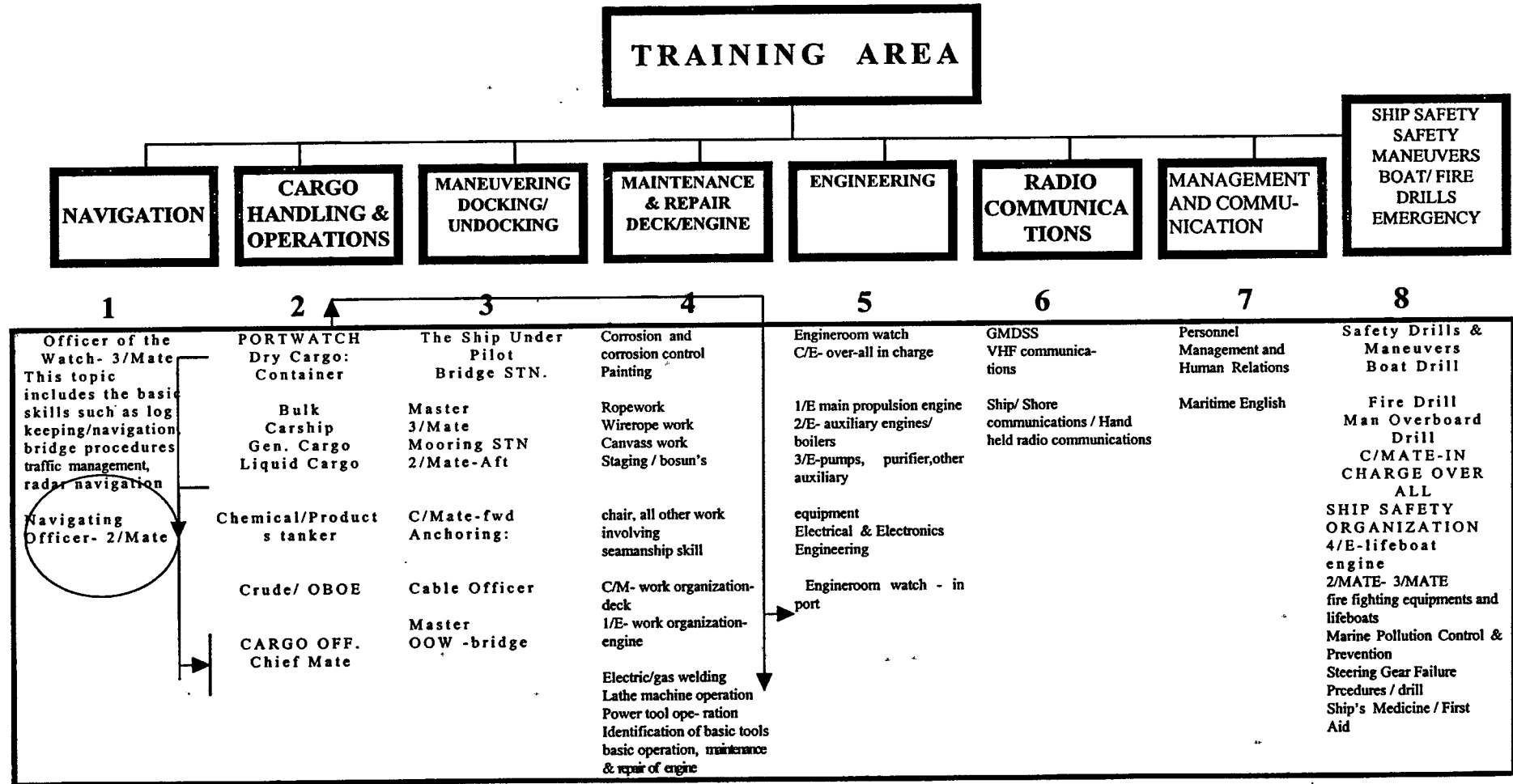


figure 4.4

Shipboard Work Routine as Training Areas

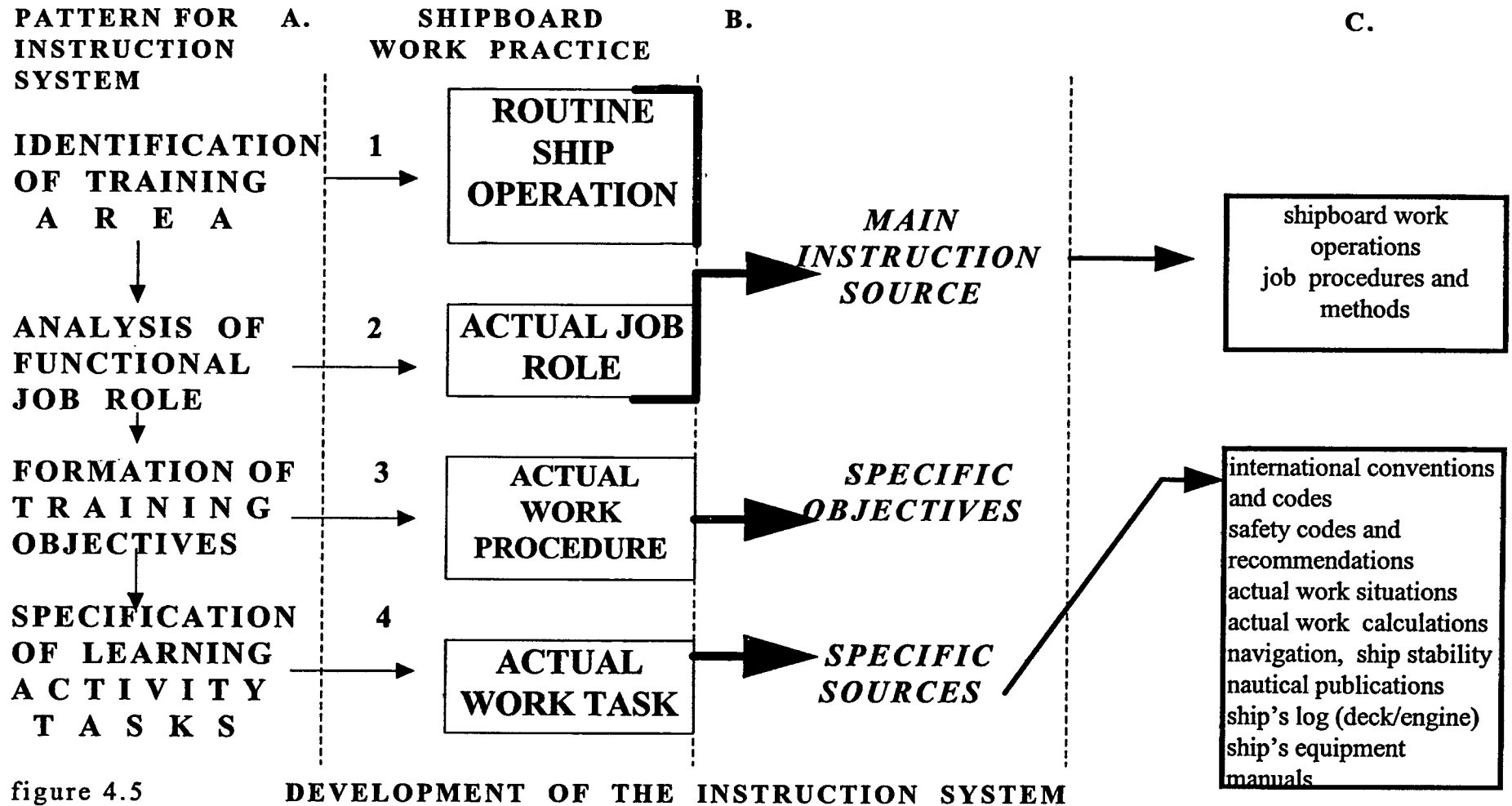


figure 4.5



## CHAPTER 5

### A MODEL INSTRUCTIONAL SCHEME

#### 5.1 Functional Rationale

The comparison made in the previous chapter between the contents of the model instruction unit and the corresponding topics in the main curriculum adequately explains the rationality of basing the instruction design on functions. It simply listed the corresponding subject in the main curriculum which contains the functional topics in the model instruction unit. The main curriculum does not include more than half of the functional topic developed in the model instruction unit. This is a significant observation thus, the remarks made by the author (who knew first hand how the main curriculum was implemented in the representative institution) supported the position that discrepancy exists between the actual professional job practice and the training outcomes of shore based instructions. The functional topic (the topics included in the model instruction unit) is either not taken in the main curriculum or if it is taken, there is no specific practical execution for the purpose of learning the task. The topic is taught as part of a particular subject e.g. navigation, seamanship but its relation specific to the purpose of executing a functional shipboard work is not taught or discussed inside the classrooms. It happens that the topic e.g. calculating courses and distances, selecting chart from the chart catalogue in relation to a particular work or job function e.g. second mate, voyage planning is mentioned during a class but never intentionally discussed to the extent of teaching methods and procedures as how it is actually used in performing the function of a second mate or the task of voyage planning. This explains why competent job performance is not achieved after the completion of the course. Clearly, this is the root cause why job positions are not assumed right after licenses and certificates

are obtained; a proof of MET's inadequacy to equip and instruct students to competently perform the job. Understudying the intended position is necessary with adequate coaching and mentoring on board.

The instruction system in the main curriculum failed to teach the functional relationship of each knowledge skill to a single functional work role. The functional topics developed in the model instruction unit are the knowledge skills presented as tasks as discussed in 4.8.2. Failing in this regard obscures the relevance and practical use of the knowledge skills as in the example previously given such as calculating courses and distances and selecting charts from the chart catalogue. If these were just taught to the student as part of the course outline or syllabus required to be covered in a semester, its effect on the student's learning is general, or without specific and detailed application. It will just form part of the theoretical knowledge and without specific purpose of linking them to a particular and actual job function.

### **5.1.1 Functional Progression**

The functional approach provides the basic concept which builds the framework of the instruction system. The progression of the functions of the regular sequence of a work routine outlines the topic of the course. The whole sequence of steps and procedures of a particular work operation leads to the performance of a specific job function. Each integral step of the whole procedure constitutes a topic and is studied one at a time as the work progresses. The course topics consist of these steps and procedures and they must be presented and learned in actual functional execution. Following this sequence, the course must be divided such that each functional topic e.g. steps and procedures, is taught at intervals. This will maximize learning as the progression intervals break the whole work function into segments devoted solely to each step of the work procedure.

The functional progression provides adequate time devoted to teaching and instructing or more appropriately, mentoring and coaching. Consequently, this will allot more time for learners not just to get familiar but to perform each procedural step and practice. It simultaneously links both of these two collaborative efforts of MET to the execution of the actual work operation.

### **5.1.2 The Divisions of Tasking Routine**

The intervals of learning progression enable the students to eventually learn the whole functional work. But again, as the functional progression breaks the learning process at an interval that will provide students more time to assimilate information, it is actually exposing the whole work operation for examination in both aspects of teaching and learning. It is at this stage of the concept's application i.e. the effect of the functional approach in the instruction scheme that the whole course topic must be divided into tasks. The complete instruction system consists of processes and procedures, methods and work situation. These are all from actual work operation. Minimum theoretical instructions will be given; the substantial part of the instructions consisting of those given practically. Appropriately, students must perform practical activities as continuous practical instructions are given. The whole instruction system must be organized into tasks and presented as a specific functional student activity.

### **5.1.3 Tasking as an Aid to Learning**

Students understand to a greater extent the topic of study presented as practical classroom or individual activity. More so if it is organized with students themselves participating in the activity. Tasking provides this greater learning opportunity. It enables the student to uncover his own difficulties in performing the tasks and to seek his own way to understand the process and procedures to get the

task done correctly. Instructors can teach the students the same things as what the student uncovered for himself in the first situation. But this is not as rewarding learningwise as when one performs the task oneself and discovers ones own difficulties. Furthermore, retention of learned information is better if the students themselves perform what they have been taught and learned. Tasking is learning by execution and performance. It concentrates on the students practically putting into practice the learned theories and principles and their further discovery of the how's and why's.

#### **5.1.4 Tasking for Skill Development**

Tasking is synonymous with training. Likewise learning by execution is training. Tasking provides the students with the opportunity to go through the same task or a variety of tasks a number of times. This is repetition and it encourages skill development and eventual mastery.

The question of competency discussed in the previous chapters boils down to a lack of skill in the performance of work functions. The tasks prescribed by the instruction scheme will require the students to perform each step in the work procedure. The tasks can be evaluated separately and time can be allocated as necessary to a specific segment of the whole work function where difficulty in the performances arises. These procedures of learning will gradually lead to the development of the skill of performing the work function as a whole.

## **5.2 Integration to the Prevailing Curriculum**

Recollecting the explanation in 4.8, the prevailing or on going curriculum is the main curriculum. The instruction scheme proposed in the paper creates an

instruction unit presented in figures 4.1 and 4.2. This is a separate instruction as distinguished from the instructions given in the main curriculum.

The instruction units are best taught in the senior year of an undergraduate program. This will depend on the structure of the main curriculum. It is also possible to offer the instruction units at an earlier time if the students have already gained the necessary theoretical background to fully understand the content of the course. Again, this will depend on how and when the main curriculum accomplishes its task of imparting basic theories and knowledge.

The instruction unit is not a new subject to add to those listed in the main curriculum. Its role is simply to introduce the actual work operation and identify the application and specific use of the basic knowledge based skills. Eventually, this will lead to a further understanding of a work function from the prescribed separate application of theories and principles. Integrating the instruction unit to the ongoing main instruction simply directs the general effect of education (as discussed in 2.32 and illustrated in figure 2.1) to the specific path towards training. It is related to the main curriculum and it should be presented as relating to it and not as a separate or "stand alone" course which will eliminate the purpose and significance of the on going curriculum.

The main curriculum serves as the main instruction system with the instruction unit providing the support and supplementary instructions; each of them reinforcing the other in terms of course content, and compounding the purpose for which they are implemented.

### **5.2.1 Affect on Classroom Routine**

The implementation of the instruction scheme will not affect the schedule of the regular classes of the main undergraduate program. The most suitable time for offering the course under the new instruction scheme for the representative institution is during the summer. The class schedules for each year of the whole academic

program of most courses are fixed. It is usually in summer breaks that an available time can be allocated for extra classroom instruction. This suggests the time allocation for the instruction scheme.

Class activities will consist mainly of tasks. Lectures will commonly be given at the beginning of each new task but to a minimum extent. Afterwards the students will spend more time accomplishing tasks either individually or in groups; the instructor constantly guiding the students in performing each task. This procedure differs significantly to methods of classroom instruction in the main curriculum where the greater part of instruction is delivered through lectures. The exercises and assessment are given at the end of the course, whereas in the new instruction unit the tasks serve as exercises and the evaluation and assessment are continuous. The students will then not experience the pressure of preparing for examination which usually results in a hurried superficial understanding of the lessons. The continuous procedure evaluates and assesses how the student puts into practice what was learned and not how much he knows. Practicing what you know is different from consciously knowing by memory. Skill is developed through practice which the classroom activity aims to achieve.

In the long run, the conduct of classroom instructions in the new scheme will influence the procedure, method and contents of the corresponding instructions in the main curriculum. The classroom routine of the new scheme will serve as a medium from which the MET delivered by the main curriculum will constantly be updated. Eventually, the main curriculum has to change its own classroom routine e.g. instruction procedure, methods and contents to respond to the relevance of adopting the new instruction scheme.

A perceived effect, seen by the author, which will benefit the main curriculum in particular is the discrepancy in terms of the whole class procedure between the instruction unit and the main curriculum that will become self-manifesting and distinct in the long run. The instruction system is a testing tool in a way to improve the job performance of students after finishing the course. But in the

process it points out the effectiveness of the new system against the deficiency of the other. It will pave the way for changes in class procedures, methods of instructions, selection and organization of course topics and most of all the adoption of an effective (functional) instructional concept.

This protracted effect hopefully will provide adequate grounds to reform and orient the main instruction system to the one proposed in the paper.

### **5.2.2 The Lesson Plans**

Planning of the lessons for the whole course is an essential part of the preparation. Efficient divisions of the course tasks and the functional progression of the whole instruction's presentation and delivery will not effectively achieve maximum learning without adequate preparation.

Lesson preparation consists of two stages. It involves the college dean or the department head and the instructor himself. The instructor under the new instruction scheme is required to go on board for shipboard duty. This is regular shipboard employment of merchant marine officers. The whole topic concerning hiring and composition of the faculty will be discussed fully in the next chapter. For the purpose of this discussion, it is adequate to know for the moment that the instructors regularly board ocean going vessels as part of the professional updating requirement and come back to fulfill a teaching assignment in school.

The first stage of preparation starts from the college dean or the department head of navigation, seamanship or whoever is delegated to be in charge of one of the training areas given in figure 4.4. He will provide the instructor, before boarding a vessel for a shipboard duty a detailed description and checklist of the topics included in his teaching assignment. This will serve as a guide for the instructor to accomplish the lesson preparation on board (see figure 5.1). The examples given in figure 5.1 are for the model instruction unit presented in the paper. Each functional

topic under a different training area will require a different checklist appropriate to the tasks outlined in its course.

SHIPBOARD LESSON PREPARATION INSTRUCTOR'S TASKS	EXAMPLES :
<ul style="list-style-type: none"> <li>document work methods and procedures on board /work situations directly related to his topic.</li> </ul>	→ general procedure for voyage planning, step by step procedure for chart identification and selection using a chart catalogue, distance and course calculations
<ul style="list-style-type: none"> <li>obtain specific information supporting work tasks and job functions.</li> </ul>	→ specific information from nautical publications, log entries and procedures, methods for accomplishing bridge log etc.
<ul style="list-style-type: none"> <li>list references and teaching materials to be used for instructions.</li> </ul>	→ coast pilots, sailing directions, guide to port entry, charts, equipment manuals
<ul style="list-style-type: none"> <li>obtain teaching aids for demonstration</li> </ul>	→ photos, video films of actual operations and work situations, important illustrations, drawings and sketches for overhead or slide projection.

figure 5.1

Instructor's shipboard lesson plan checklist

The requirement of a shipboard lesson plan mainly makes certain that actual situations and current work methods and procedures are documented and used later in classroom instructions. This will guarantee that they are up to date as some aspects of the actual work environment are brought into the classroom and will encourage skill development and the eventual achievement of on-the-job competency.

The collection of on the job work methods and procedures is an initial step for research activity to find out or measure how different the actual professional



shipboard work practice is from what is being taught in school. The result of such a research effort will justify the reforms needed in the main instruction system. This will be a reactive response to the protracted effect mentioned in the previous section.

The instructor himself accomplishes the second stage of preparation. He then develops these materials into an instruction he will deliver in class according to the design and concept of the instruction scheme. The preparation of the instructor will mainly concentrate on the organization of his own presentation, the sequence of instructions, preparation of visual aids and writing, compiling and printing of the necessary hand-outs for the students. The conduct of a classroom instruction using the new instruction scheme will require appropriate classroom facilities and other equipment of the school.

The school itself at the same time must make sure that its faculty possesses the necessary pedagogical skills. The school either organizes its own seminar on teacher training or sends its faculty to take instructor training courses in universities or training centers within the country or abroad. This is necessary especially for simulator instructors.

### **5.3 Physical Set-up of an MET Institution**

The venue of instructions requires adequate equipment and facilities both for the instructor and the student. The instructor needs to carry out an effective teaching assignment and the students need to perform the tasks set out in the course. The model instruction unit presented in the paper will require a classroom with enough work space to accommodate first the chart tables, chart shelves, bookshelves for the nautical publications, plotting lights and equipment. The classrooms have to provide the atmosphere similar to the work environment aboard ship where a particular job function is performed. This will also require similar materials used on the job as the materials used for instructions.

The physical set-up will depend on the requirements of the topic of the instruction system. Instruction units in basic bridge watchkeeping, the Officer of the Watch, which is a basic function of a thirdmate will require a computer laboratory for the computer-based simulator software to start with the instructions. Similar laboratory equipment e.g. computers, projections screens, must be provided to an instruction unit dealing with loading and discharging /stability and trim; the function of a chief officer. The examples of equipment above are for the basic instructions throughout the course. The culminating activity or exercise of each of the instruction units should be performed in a full simulator if the school is so equipped and if the task can possibly be performed in a simulator.

It is necessary that the equipment and facilities required by the instruction are provided, otherwise the whole purpose of bringing the classroom learning activity closer to the actual work situation will be defeated.

#### **5.4 Implications to other Aspects of MET**

There are several important aspects of MET that will be affected if the instruction scheme is adopted to support the main curriculum. The first aspect is the accreditation of the whole course, if each instruction unit of the training areas in figure 4.4 be considered a part of the whole academic program of the baccalaureate degree and if not, how will the college justify offering the additional courses to the students? The instruction units must be included as part of the academic program, otherwise their validity as a requirement for the students will be questioned. They can be made as mandatory modules for the students prior to the completion of the academic program. The most important justification is the need to update the current curriculum and to implement competency-based instructions to bring the shipboard job practice closer to the classroom learning environment. The next issue is how should the results of evaluation and assessment be treated? Will they be considered part of the official grades of students? Since the instruction units can be made into

mandatory modules for the students and included in the academic program, then student performance must be evaluated and assessed. The results must be included in the calculation of the final marks of each student at the end of the academic program.

The successful adoption of the instruction scheme does not depend only on innovative methods and procedures in teaching and lesson preparation. The academic issues must be addressed to justifiably require students to take such additional courses as part of the existing academic program.

At this point two of the four implications of the instruction scheme have been discussed. First, the effect on the present MET in terms of updateness and relevance and second the initiation of research activity as a reactive response. The third is the academic issues as discussed in this section. The fourth implication creates a more compelling reason for the administration to provide materials both for instructor and student. The tasks outlined under the course topics cannot be effectively taught and learned without the use of actual publications, charts, and equipment. The previous chapter dealt with the equipment and facilities. What is pointed out here is that the school will be obligated to provide the necessary materials for both the instructor and the student as required by the instruction scheme. This is a valid justification for such requests of materials since these materials will not be used only as references. There is a system of methods and procedures for their use in a prescribed instructions scheme. If an MET institution adopts the instruction scheme it follows that it is ready to provide all the necessary instruction materials. This will help school administrations defend its budget plans. The appropriation of funds depends much on the justification of such budget plans and proposals.

## **CHAPTER 6**

### **New Instruction Scheme and Manpower Resource Implications**

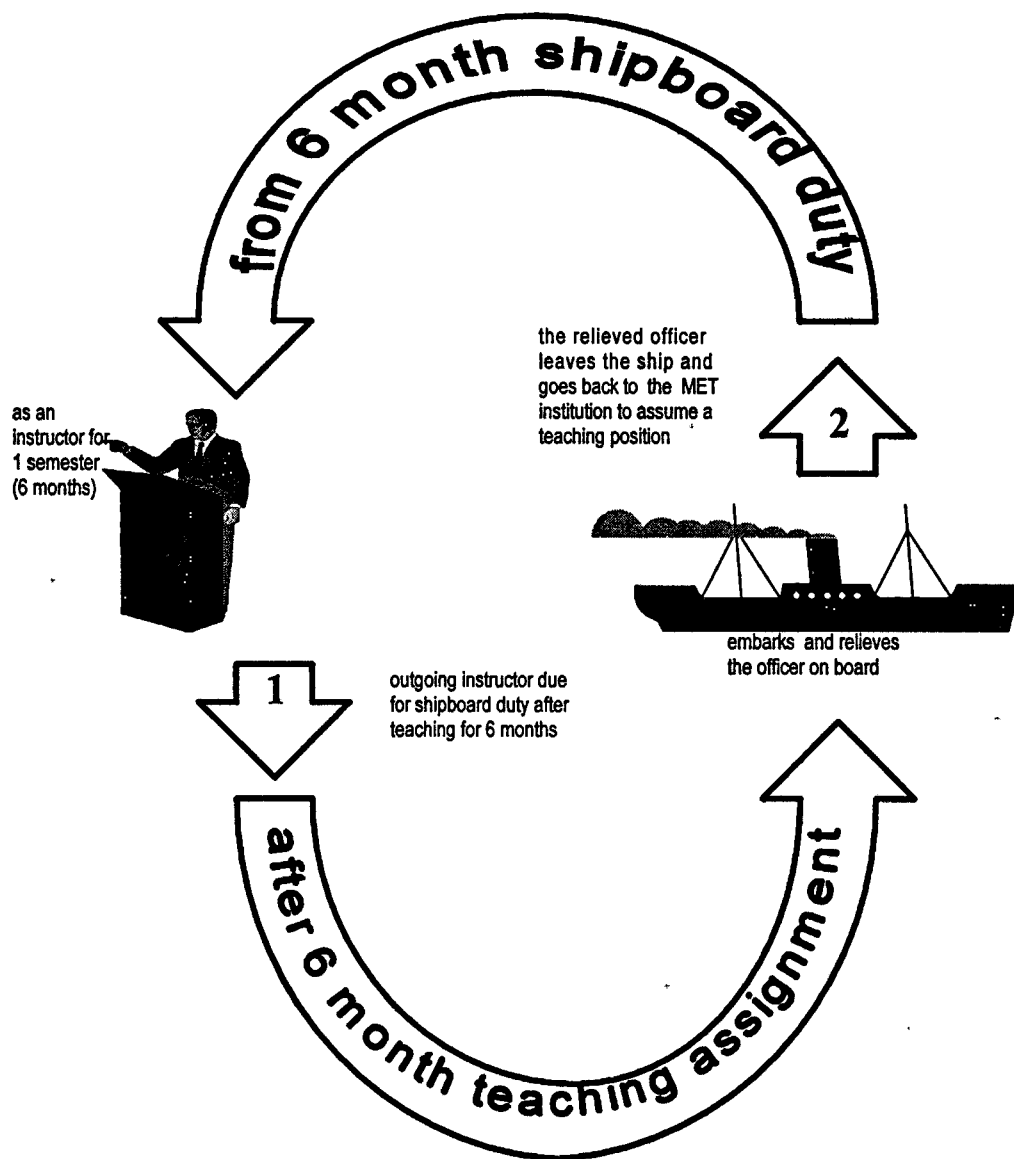
The adoption of the instruction scheme has definite implications for manpower resources. The manpower capability is a critical determinant of the successful and efficient implementation of any program especially those concerning the academic matters which involve both the curriculum and the faculty. The administration and qualification of the teaching personnel are the foremost factors which affect the performance of the faculty as a whole.

#### **6.1 Implications of hiring/ selecting / composing faculty**

The updated and relevant course content of the instruction scheme will not materialize unless the instructor handling the course is on regular shipboard duty. This will take the instructor away from his teaching assignment to embark on a vessel for shipboard duty.

The resulting scheme is an alternate sequence of shipboard duty and shore teaching assignments. The school has to hire two sets of faculty to facilitate this scheme. The group that is ashore performing teaching duties is the "active faculty", the other group shall be the "faculty on shipboard duty." The recommended relieving of the instructor ashore by the incoming instructor from shipboard assignments and vice versa is during the semestral break. This is the best time as it will allow the incoming instructor to have at least a week off before reporting to prepare for the coming semester. The instructor due for shipboard duty will also have at least a week off before embarkation. Based on the academic schedule of the

representative institution, the length of sea duty for faculty members is six months to coincide with the semestral division of academic study.



*figure 6.1*                      **Teaching assignment / shipboard rotation scheme**

The concept of alternate sequence of shipboard duty and teaching assignment, illustrated above, will only materialize with the hiring of two sets of faculty. This already has an implication for hiring in terms of numbers. The situation where the instructors can also relieve each other with respect to the positions on board brings

the possibility of involving the shipping companies in participating in the school's faculty employment program, in order to implement the whole instruction scheme.

The scarce supply of teaching personnel is the main problem of most MET institutions. As pointed out in 2.4.3., this is due in part to the insufficient salary paid to faculty members. They either join private training centers and schools or go back to sea for shipboard employment. The shipping company can be tapped to subsidize the salary of a member of the faculty by sponsorship. This will require the sponsored faculty member to regularly board the vessels of the sponsoring shipping company.

First, the shipping company will have the advantage of having a regular supply of officers for as many instructors from the school it sponsors in the hiring scheme. Almost all the shipping companies in the Philippines, through their local manning agencies, have established and continuously maintain their pool of crew and officers. They prefer to employ the same line-up of crew and officers on regular rotation if possible on the same ship. This trend of hiring and employing seamen and the employment program as proposed with the participation of the shipping companies, fits this trend.

Second, the shipping company can document this as their participation in a cooperative effort with the MET institution and the government (in the case of the representative MET institution, the cooperation is also with the government as PMMA is a state maritime academy) to put into effect the provisions of the revised STCW specifically section A 1/6, dealing with the training and qualifications of supervisors, instructors and assessors. Most importantly, the assistance of the shipping companies as explained will largely contribute to fulfillment of the safety management objectives of the company under the International Safety Management Code (ISM). This will be further discussed in 6.4.1.

The subsidized salary will attract qualified instructors and encourage them to be permanently employed as faculty members and make the teaching profession a part of their careers. Merchant seamen are employed only when they are aboard. After finishing their shipboard contracts they sign off and have a well deserved

vacation. During this time these seamen are not actually employed and are not earning but the family expenses are the same. The vacation pay will cover part of these expenses but often is not enough and the seaman has to reapply to his company and board a vessel again. There are many who manage to find work in shipping companies with an adequate salary though less compared to a shipboard pay.

The real point here is not so much the salary (as "adequate" means just enough to meet the daily family expenses) but extending the vacation so the seaman can spend more time with his family. How about those who do not manage to find work during vacation? They teach in maritime schools but they leave sooner than they prefer to stay because of the inadequate pay. They have to board a ship again for a contract of up to ten months. The result is a long shipboard contract, a short vacation and stay with their families.

The employment scheme actually balances the situation explained above. There is an equal time of work aboard and ashore. The time of work ashore is most important to seamen since this is also the time when they can be with their families. Added to this is the adequate salary they will receive as they perform their teaching assignment ashore. All this is part of making teaching a part of their professional career if they are hired under the employment scheme.

The employment contract must be drawn up and agreed by both the shipping company and school which will depend on conditions laid down by each party. What is advocated in this paper is the basic concept of the cooperative effort of hiring. Basically, hiring for both the teaching assignment and shipboard duty is six months; six months teaching in the school with a subsidized salary and six months on board. A faculty hiring plan will be presented after the faculty rank distribution, teaching load distribution and competency have been discussed in 6.2. This will explain in full the participation of the shipping company in the hiring scheme. The role of the shipping company is adequately explained for the purpose of discussion in this part. The discussion in 6.4.1 will further support the need for the participation of

the shipping companies and the advantage they will gain in the proposed employment scheme.

With the shipping company's participation in the hiring scheme, the faculty members of one set must have the same rank and more or less the same shipboard experience as the other set of faculty members if the shipboard rotation is to take place as the rotation in teaching assignment. At this point the school has to consider the following in hiring and selecting its teaching personnel:

- two sets of faculty members must be hired
- qualifications and shipboard experience must be more or less the same for each rank within a set of faculty members.

The composition of the faculty will be fully discussed in the next section.

The following discussion explains the situation involving the representative institution, PMMA. Several employment issues are included as they affect the hiring concept of the instruction scheme. It is a specific situation which the author sees as a way to present to the readers as to how the hiring concept will apply to specific schools and government employment rules and regulations.

The PMMA as the government institution applying government rules on employment has actually hired all the members of the faculty on a permanent status allowing only a length of time for leave of absence to update their licenses; practicing their professional capacities on board. They must all have a permanent status so they will have to come back to continue teaching. A temporary status will defeat the purpose of creating a trained pool of instructors and will render other programs of MET ineffective, especially the upgrading and training of the faculty.

The group of instructors who are ashore and teaching is referred to here as the "active faculty." They will perform the teaching assignment while the other group of instructors, their counterpart is serving aboard the ships of the sponsoring company. Each instructor will be paired with one other of the same rank and the same subject assignment in teaching. The only difference is that each will teach in a different semester. For instance, Navigation, one will take Navigation 101 (first



semester) and the other upon his return Navigation 102 (second semester). The college will see to it that all teaching loads are distributed to instructors before they leave for shipboard duty as explained in 5.2.2. This is necessary so they can do lesson preparation aboard as indicated in the previous chapter. Another advantage of the project is that both the "active faculty" and the instructor on shipboard duty will be given a fixed teaching load assignment (the next section will discuss this point) to encourage specialization and continuity of lesson planning and instructions.

An instructor hired permanently by PMMA on shipboard duty performs all regular work routines according to the position he signed-on. This is just the usual hiring of a seaman by the shipping company only this time he has to board the ships managed by the shipping company who sponsored his additional salary (as discussed in 6.4.1) during his teaching duty at PMMA. Aside from this, he has to perform other tasks concerning the subject he has been assigned to teach at PMMA. These are mostly documentation of shipboard work routines related to the topic he is teaching. The dean in each college will assign such items to be documented and developed into instructional format for use when he comes back to teach at PMMA (as discussed in 5.2.2.). As mentioned before this is to take advantage of the regular instructor consistently onboard to transfer the on the job routines through instructions; a very good method for skills and competency development for maritime students. The instructor needs to write and plan the lessons depicting actual work situations with actual examples. He has to convert these into instructional materials and develop hand-outs for the shipboard tasks identified and assigned by the dean. The theoretical knowledge taken beforehand will be ably supported by actual examples from actual job situations on board. The use of textbook examples will be limited to basic knowledge and theoretical explanations. Recalling the discussion in 5.2.2, what this scheme will concentrate on is applications from shipboard work routines in instructional format with actual tasks as examples and finished work routines intentionally reworked as tasks for the students to perform and work by themselves as exercises. This will make the instructions in Maritime

Education and Training more adaptive, relevant, up-to-date (using actual publications and work materials on board) and most of all concentrating on skills and competency development. Furthermore, the MET institution will be forced to provide the returning instructor with the actual materials, equipment, and shipboard publications otherwise the instruction will not be as effective as was planned.

The participation of the shipping company in the hiring scheme will upgrade the salary of the faculty. This has a positive effect on recruitment and selection. The school will be able to implement selection measures to choose qualified officers for teaching assignments, hiring procedures and most importantly create a basis for rank distribution and teaching load allocation.

## **6.2 Faculty Rank Distribution /Teaching Load Allocation and Competency**

From the discussions, so far with the participation of the shipping company in the employment scheme, the school needs to determine how many instructors it will hire (depending on how many each school requires) and the qualifications of each of the faculty members in the two sets. These qualifications are with regards to the positions on board and also related to the teaching assignment.

The Revised STCW clearly stipulates the provisions regarding the qualifications of supervisors, instructors and assessors. These requirements are also followed in the implementation of the instruction scheme, specifically the requirement dealing with "in-service training" (Revised STCW Sec. A-I/6, par. 4.1 ). It simply requires the instructor directly conducting the training "to be qualified in the task for which the training is being conducted" (Revised STCW Sec. A-I/6, par. 4.1). The instruction scheme adopts the concept of "functions" that aims to teach the actual work methods and procedures of the professional job on board. This implicitly requires that the instructor must have performed the actual professional work onboard before he can teach the work procedures and methods of his own job

function. The training areas in figure 4.4 can be divided into the four functional ranks, captain, chief officer, second officer and third officer for the deck. The number of each instructor for each rank will depend on the number required for each school. For now, it is clear that the faculty hired must be composed of the four ranks both for the deck and the engine. The training areas, as divided among these ranks, will be their permanent teaching load assignments. These topics, as they were assigned respectively to each rank, will also be the same topics they will prepare for on board when they leave for shipboard duty. The ranks that the faculty have must be the same rank that they are actively serving onboard.

This discussion points out the basic concept and requirements of the instruction scheme in relation to the rank distribution and teaching load allocation. There are other aspects to consider which will depend largely on the hiring regulations of the school and its government and most of all the conditions laid down by the participating shipping company and the school. The following illustrates and further explains the points discussed in a specific situation. This applies to the representative institution. Several points, though specific, will give the reader an idea of how the whole hiring scheme works and how it affects the points discussed in this section.

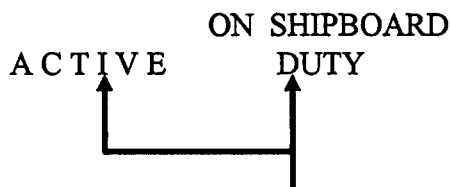
The figure in column A, which is the active faculty members ( the group of instructors actually teaching ashore) will depend on how many instructors a school needs. The figure in column B must be the same as column A since each instructor must be paired with another to fulfill the shipboard duty/ teaching rotation. It does not represent the number of officers manning a particular ship. Each figure in each rank in column B is just the number available for sponsorship by the shipping companies which logically must be the same with the figure in column A if the shipboard duty/ teaching assignment rotation is to materialize as previously mentioned. The figures in the example just illustrate the principle involved and will vary according to the specific requirements of the school.

figure 6.2 (continued on next page)

**FACULTY HIRING AND QUALIFICATION :  
Proposed Scheme for the Philippine Merchant Marine Academy**

FUNCTIONAL POSITIONS:

↓	<b>A</b>	<b>B</b>		<b>1</b>
CAPTAIN -	3	3	←	MEMBERS OF THE FACULTY HIRED MUST BE FITTED TO THE STANDARD FUNCTIONAL POSITIONS ACCORDING TO THE LICENSE THEY HAVE ACTUALLY SERVED ON BOARD
CHIEF ENGINEER				
CHIEF MATE -	3	3	←	
2ND ENGINEER				
SECOND MATE -	3	3	←	
3RD ENGINEER				
THIRD MATE -	3	3	←	
FOURTH ENGR.				
	12	12	TOTAL =	(24) IN EACH COLLEGE



If the total that can be hired by PMMA is 12 then the total number of faculty members to be hired will total 24 with the equal distribution of all ranks. Other willing faculty members to be hired, who accept a functional position lower than the license served on board, cannot be allowed since as the program continues, these hired faculty members will acquire higher licenses. They will be promoted on board but they will remain in their functional position in the academy faculty list unless a member retires and one must take his place who has the required license and possible experience when serving on board.

**COMPENSATION      2**  
**OBTAINING A HIGHER**  
**LICENSE**

The shipping company will only pay the faculty member on teaching assignment ashore 1/2 of his basic pay plus 1/2 of the overtime. This is based on the position he served on board. The academic qualification is not considered since that has nothing to do with the duty on board which has already been considered in the government pay of the instructor. If the instructor obtains another license his pay, of course, will increase on the government side but not on the added pay from the shipping company unless he serves in this position on board. The faculty member must serve the higher license on board before he starts to receive the higher pay from the company.

**LOAD DISTRIBUTION**  
**LICENSE / ACADEMIC**  
**QUALIFICATION**  
**CONSISTENSIES**  
**PROMOTION TO SENIOR**  
**POSITION**

**3**

Faculty members are hired according to the standard functional positions. They will be assigned permanent teaching loads to encourage specialization and continuity of instruction. If they are promoted on board, they will still retain their original hired functional position and teach their assigned teaching loads corresponding to this position. They will be shifted to other higher functional positions only if there are positions vacated as in the case of retirement. Master licensed faculty members within age limits should be given priority to post graduate scholarship. Retiring master licensed faculty members must be rehired to teach on the graduate course, the reason why they have priority in scholarship programs. This trend must be established so that license is consistent with academic qualifications for people occupying senior positions.

*figure 6.2*    **FACULTY HIRING /QUALIFICATION SCHEME**  
*(continued from page 74)*

**6.2.1 Shipboard Experience Basis**

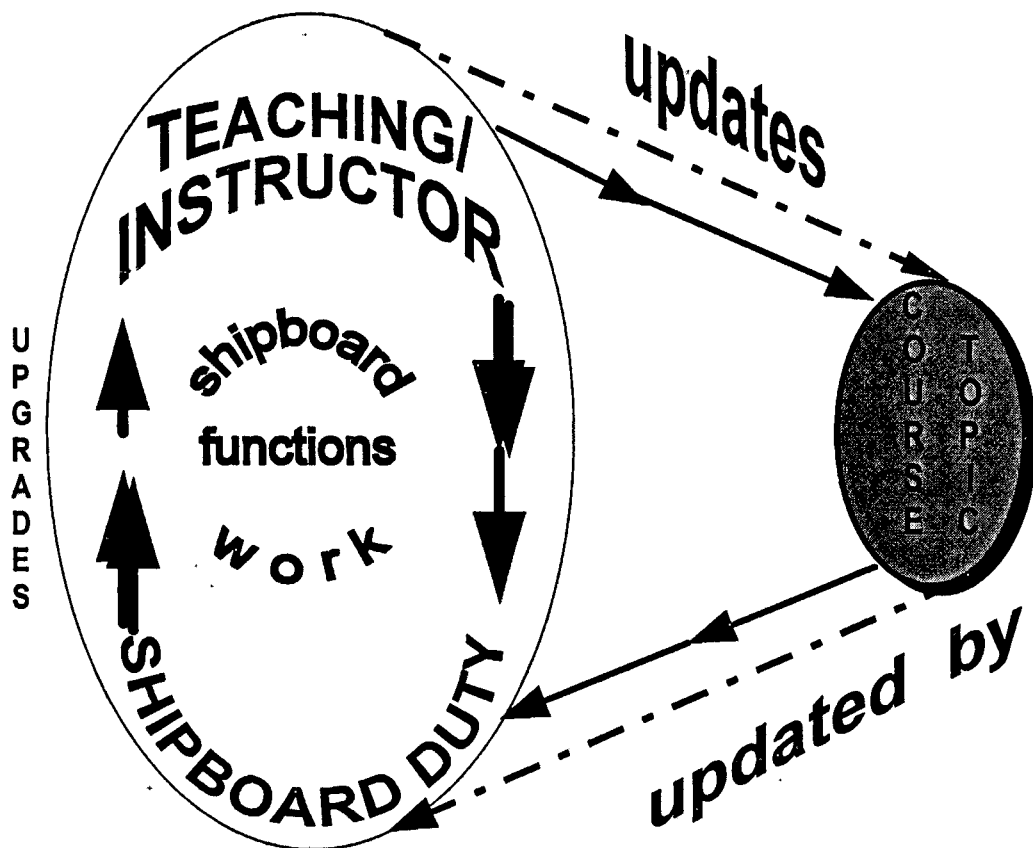
Shipboard experience is a single criterion that forms the foundation of the functional approach of the instruction system. It is thus used as the main basis for the selection, teaching load allocation, rank distribution within the faculty and, most

importantly, the qualification to teach the functional topics of the instruction system. The selected instructors must have actually used the licenses they have as they are hired according to the functional positions as in figure 6.2. The rank distribution must be equal for all the functional positions and the teaching load ( topics for instruction) will be distributed among these functional positions. These are the permanent teaching assignments which are necessary as explained in 6.1. The shipboard experience of the whole faculty must be varied. In the example given in figure 6.2, the experiences of the three chief officers need not all be from bulk ships. One must come from tanker ships, another from bulk ships and a third from reefer or container ships. The school administration must select the instructor who they think has a varied shipboard experience to benefit from it in the future teaching assignment. The instructor must also be acceptable to the shipping company since he will board alternately every other six months. This again concerns the shipboard experience.

### **6.3 Employment Upgrading of Faculty**

The whole plan of the instruction scheme not only considers the aspects of relevance, course content (from actual work practice) and continuous update of course topics. It also aims at providing a continuous updating scheme for the faculty delivering the instructions. The continuous updating scheme is the alternate shipboard duty and teaching rotation. This requirement will update the instructors on the current work practice on board and will give them a chance to practise their profession and update their licenses. A regular sequence of professional work practice and teaching will provide an opportunity for the instructor to discover further what there is to teach and to discover means to impart the knowledge and practical procedures of work to the student. This is encouraged by the lesson plans the instructor brings on board. The alternate scheme is the shipboard and teaching rotation, working to allocate time to upgrade the professional practice (shipboard

work) which in turn provides a chance to update the course topics (as the instruction content comes from actual work practice) and the teaching practise performed ashore. We see at this stage how the requirements of the whole instruction system following a single concept of "functions" e.g. shipboard work functions are organized such that the fulfillment of one will serve the purpose of the other requirements.



*figure 6.3*

**Cycle of Effects of the Requirements**

The cycle is centered on the shipboard work function aboardship and on the course topic ashore. The instructor on shipboard duty performs his own work function

aboard and is professionally updated, consequently upgrading his license at the same time. This in turn updates the teaching practise of the instructor as his work function on board is the course topic he will teach ashore. In effect, this updates the course topic once he delivers the instruction fresh from shipboard duty with new work situations to learn from. The cycle then repeats itself again.

The adoption of the instruction system will simultaneously bring about the advantageous and beneficial effects of the cycle of requirements. The author would like to stress in this part of the discussion that the shipboard duty serves to upgrade the shipboard side of the instructor's employment. This concerns his license which will provide an opportunity for his promotion on board and not stagnate due to his teaching assignment. Promotion on board will also be a criteria for his promotion in his job ashore as faculty member. It should be realized here that the **cycle of requirements serves to provide an effect that the profession of seafaring updates the profession of teaching and at the same time upgrading the teacher's other profession on board.** This provides a renewed value for shipboard experience as a required tool for the practice of another profession e.g. teaching. The seafarer as a teacher will have two professional fields of advancement each complementing the other, a significant step towards the upgrade of employment of a seafarer not just as another seafarer and not just as a teacher but as both.

### **6.3.1 Salary and Permanency**

Employment upgrade in terms of salary and permanency can be achieved in two ways. First, the salary of the faculty members will increase as it is subsidized by the shipping company ( this point is appropriately discussed in 6.4.1) which will participate in the employment scheme. Second, the instructor can still earn more as he has a chance to board a vessel of the sponsoring shipping company. In terms of permanency as mentioned in 6.1, the faculty members will be hired on a permanent status by the school. This will ensure that the faculty will retain its members and



also ensure that the shipping companies as agreed will have the sponsored instructor as part of their regular shipboard personnel. The instructor is employed permanently ashore and has a regular employment opportunity aboardship.

## **6.4 Applicability and Timeliness**

The applicability of the entire instruction system with the employment / hiring scheme for the instructors will depend on two factors:

- how the government and the shipping companies recognize the whole scheme as a step to answer the need to reform the MET specifically in the Philippines and
- the commitment of the resources involving both the manpower requirement from the school and financial assistance from the shipping companies.

There has never been a time more appropriate for changes in MET to take place than now. This is made more urgent with the revision of the STCW reflecting the worldwide concern for seafarers' training. Equally the implementation of the International Safety Management Code (ISM) contributes to this urgency directed more to the shipping companies. The collaborative effort needed from the government and the shipping companies to implement the whole scheme will constitute a positive and timely response to the requirements of the two codes.

### **6.4.1 Effort of the Government and the Shipping Companies**

The whole scheme presented is a parallel effort between the government (the representative institution is a state maritime college) and the shipping companies to raise the standards of employment of the technical faculty who are merchant marine officers so they will provide a committed service of teaching. The cooperative effort addresses the main problem in retaining teaching staff which is salary and permanency as explained in 6.3.1. This aspect of employment must be given

adequate attention if a successful implementation of any instruction system is aimed at. There has to be a program planned for the faculty simultaneously implemented with academic programs such as the instruction scheme.

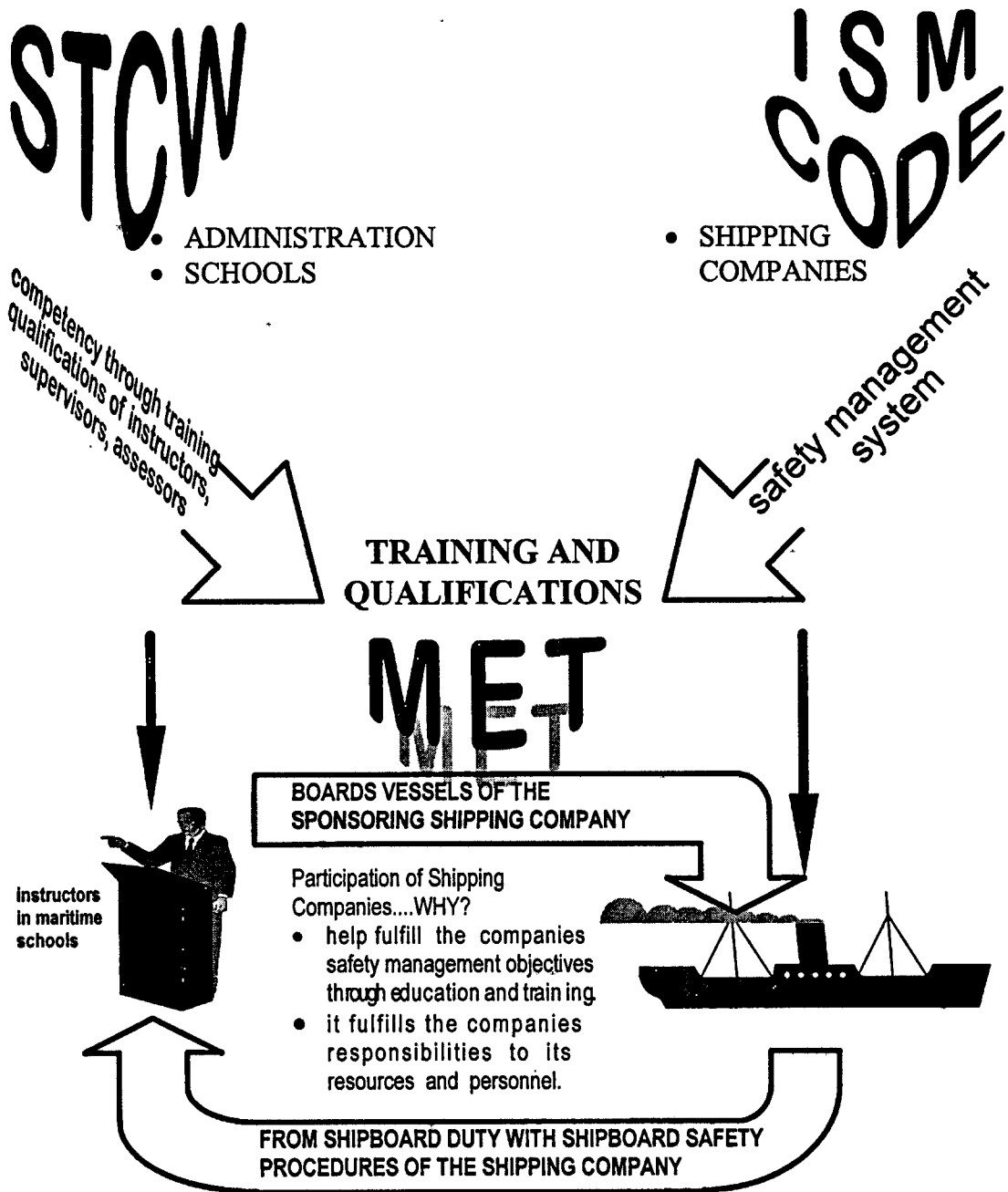
The government and the maritime schools have the task and duty to improve the MET. This is for the sole reason of maintaining standards to remain competitive in the profession of seafaring. The effort must be directed to the foundation from which these standards are produced to earn the qualifications to be competitive. It is the MET that establishes these standards and qualifications and it is the place where efforts should be devoted for improvements.

The other key role is played by the shipping company. They own, manage and operate ships for the purpose of business and profit. In the light of the ISM Code as previously mentioned, the management of ships requires a system from which ship operations are carried out safely. Ship operations are performed by the crew and officers and their performance on board is very much determined by what kind of training they had before embarkation. The shipping companies can implement part of the requirements of a particular provision of the ISM Code ( refer to ISM Code par. 6 ) concerning the resources and personnel through the schools. It can take advantage of the instruction system as proposed to implement the training and orientation requirement of its Safety Management System (SMS). The shipping companies can extend the implementation of their SMS to MET institutions by participating in the instruction scheme as proposed (see figure 6.4). Again this brings us back to the issue of training and qualifications, this time as a concern of the shipping company.

The equal concern of training and qualifications merits the combined effort of the government and the maritime schools and the shipping companies. The schools are producing the manpower resource that the shipping companies need to man and operate their ships.

The SMS contained should ensure the compliance to mandatory rules and regulations as stated in ISM Code par. 1.2.3.1. This is directed to the shipping

companies. The most relevant among these mandatory rules and regulations affecting the shipboard personnel is the STCW. Compliance with this international



The deficiency of MET is the inadequate supply of qualified teaching personnel. The shipping company can concentrate its assistance on attracting instructors and help MET institutions accomplish their objectives.

figure 6.4 ASSISTANCE OF THE SHIPPING COMPANIES TO MET

code is also tasked to the government and the maritime schools. Again, both the government and the shipping companies find themselves equally concerned with compliance with a code affecting training and qualifications.

The sectors concerned must equally participate in the implementation and development of any kind of scheme and program.

“ If undertaken without the **top management’s wholehearted endorsement** and active participation of representatives of constituencies that will be affected in one way or another.....it is certain to be less satisfactory, and it may even be doomed to failure.” ( Tracey, 1992, page 41)

#### **6.4.2 The Relevance to the New STCW**

The proposed instruction scheme will prove timely and applicable if compliance with the revised STCW is aimed at by both the government and the shipping companies. The combined effort required by the proposed instruction system from both the government and the shipping companies is directed this time not just to the implementation of a program for students but equally for the instructors. The development of a new training program for the students with corresponding tasks (lesson preparation) and qualification requirement for the instructors are two main specifications of the instruction system. These will prove its relevance to the revised STCW. The implementation of the instruction system will fulfill the requirements of the main specifications and support the compliance to the code.

The instruction system requires that the contents of the instruction itself i.e. course topics, are the functional work aboardship with corresponding tasks as student activities. The training areas presented in figure 4.4 will cover the competence specified in the table of specification of minimum standards of competence of the revised STCW Code A. The tasks in the instruction system in each of the training

areas as performed by the students will demonstrate the same competence which the revised code requires.

The requirement for instructors to have actually served professionally on board and the licenses they held before they teach the functional topics is an important specification of the instruction system. This corresponds to the provision of the revised STCW which requires the "instructor to be qualified for the task for which training is being conducted" (Revised STCW, section AI/6).

The whole instruction system answers the requirements of the revised STCW concerning the MET and the qualifications of instructors, supervisors and assessors. The revised STCW emphasizes the demonstration of competence in the work place which is given the same emphasis in the instruction system through tasking. The concept of the instruction system adopts the function of the actual shipboard work as the course topic itself brings the actual work situations where competency is judged to the classroom to be studied. As the government adopts the proposed system, the whole scheme can be documented as the part of the administration's effort to comply with the provisions of the revised STCW concerning competency in the performance of work functions on board. The hiring and qualification requirements with the assistance of the shipping companies will make sure that instructors are qualified to the task they are teaching. The whole instruction system is designed to provide task oriented training concentrating on the demonstration of competence through performance. The requirements concerning the teaching personnel, e.g. qualifications and experience, when fulfilled is the same as complying with the requirements of the revised STCW regarding the instructor's qualifications.

## **6.8 A Boost to the Government's Effort to Improve MET in the Philippines**

The adoption of the proposed instruction system will constitute the much needed overhaul that MET in the Philippines needs. It will inject relevance to the

education and training and most importantly create a standard qualification for instructors. The standard qualification requirements for instructors will definitely improve the instruction in MET institutions. Instructors' standard qualifications of course, must have a corresponding competitive salary which the whole instruction scheme will provide if successfully implemented with the shipping companies. This will definitely attract qualified instructors and will contribute substantially in the implementation of training programs and instruction systems.

The instruction system represents one among the many training programs that can be used to reform MET. The manpower resource, which will execute the changes needs to be part of the whole plan for these changes. This will truly be a big boost for the successful implementation of change if faculty employment is upgraded with the adoption of new training schemes for MET purposes.

## CHAPTER 7

### CONCLUSIONS AND RECOMMENDATIONS

#### 7.1 Conclusions

The direction followed by MET in the past has been more towards the learning of knowledge and less towards the means to demonstrate such. The general effect of education prevailed rather than in equal proportion with the specific effect of training. Today, when the questions of competency are well supported by globally adopted codes and rules and regulations MET has to find ways to answer these questions. The past approach of a mostly knowledge based education must change to one which places more emphasis on performance rather than just mere knowledge of a work task. The effect of the shortcomings of MET in most developing countries is summarized in the following points:

- a.) knowledge requirements of the courses are fulfilled but fail to relate the separate knowledge skills to a single work/job function. This results in :
  - i. students have to sort out the general knowledge they learned and fit it to the job functions they encounter on board.
  - ii. officers undergo the same experience and cannot assume immediately the position in which they intend to be employed. This results in the common use of coaching and mentoring after some time to effectively perform the work function.

- b.) Training equipment and actual work materials are less used in classroom instructions where mostly textbook situations are taken up. This is due to the unavailability of funds and an instruction program which will justify its use.
- c) Lack of an employment program for the technical faculty is the main cause of a shortage of qualified and permanently employed instructors.

The present situation of MET in most developing countries is made more serious by the lack of resources, both in material and in qualified manpower. This is the most likely result of the lack of attention from most of the governments and the perennial effect of politics in the maritime industry.

MET must devote more attention in training with specific programs and instructions to reinforce the main curriculum. This involves not just the methods and procedures but equally important requires a program for the teaching personnel who will deliver and execute the new training scheme.

## **7.2 New Scheme of Instruction**

The on-going curriculum, as the main instruction system, imparts most of the knowledge requirements of the course. These instructions are mostly theoretical and although practical learning routines are performed, these instructions do not represent the actual work procedure on board. The pace by which the work tasks are influenced by the use of technology makes the common textbook situations taken in classrooms today irrelevant, out of date and redundant. MET needs to have an instruction system that specifically relates to the general knowledge skills gained by students to what is being practiced on board. The instruction system as proposed mainly accomplishes this and reinforces the on going curriculum in terms of:

**RELEVANCE.** The instruction system uses the actual work situation on board as the course topic itself presented according to the functional positions and job roles on board. This immediately imparts relevance as the general knowledge gained in the



main curriculum is put into its intended use as it is correlated with actual work situations in class.

**SKILL DEVELOPMENT.** Tasking is the main class activity of the whole instruction scheme. The methods and procedures of the functional work situations taken up in class will be learned as they are performed by the students themselves. The tasks are the actual work routine on board prepared by the instructors according to the sequence of its execution. Each step of the whole work procedure will be performed by the student enabling him to discover how to put into practice the knowledge skill he previously learned. Tasks can be repeated and continuously evaluated.

**REGULAR UPDATE.** The instructors delivering the instruction scheme are rotated alternately to board merchant vessels to update themselves professionally. The teaching load assigned to them will also be regularly updated on every shipboard duty of the instructor. The instruction units will serve as the medium through which the changes in the work methods and procedures on board will constantly be included in the instructions ashore to update the main curriculum.

### **7.3 The Necessary Unified Effort and the Corresponding Faculty Employment Program**

The problem of the supply of faculty members exists plus the issue of how to make the maritime education and training more relevant and focused on skills and competency. These two issues must be provided with a sound and complementary solution. A program is needed that will find a solution to the first and in the process of implementation will find an answer to the second. The proposed program intends to do just this. Cooperation between the maritime institution which trains and provides the shipboard workforce and the shipping companies which require such a workforce for embarkation will settle both of the issues at hand. The revision of the STCW further emphasizes the need to address the problems affecting maritime

education and training. The sponsorship of instructors by the shipping companies will raise the salary to a competitive level. This will attract qualified instructors and will solve the problem of scarcity of supply. In turn this will influence maritime education and training, specifically its delivery. Permanency will be encouraged which will earn commitment for the maritime institution. Justification of the implementation of other programs is dependent on the issue of permanency. The problems of hiring and employment of instructors need to be addressed as they are the people tasked for the effective delivery of maritime education and training.

#### **7.4 Recommendations**

This paper presents a model instruction scheme focusing on a single work function e.g. second mate/ voyage planning. This is adequate for the purpose of establishing the concept of the whole system as a reinforcement to the main curriculum. There are many other ways to put the concept and the instruction scheme into practice and certainly several other model instruction schemes of this type. The following recommendations are given in the correct order of execution.

- i. Initiate a job analysis of the four functional positions both in the deck and the engine departments and all functional work routines aboard ship. This will involve merchant marine officers and engineers hired especially for this purpose. The result of the analysis will be converted to courses similar to the model presented.
  
- ii. Undertake a comprehensive instruction plan covering the materials to be used in instruction, tasks preparation, evaluation and assessment, lesson presentation and plans for insertion in the main curriculum.

- iii. Conduct a short study and analysis of the impact of the prevailing curriculum and the effect of the adoption of the instruction scheme in the compliance to the revised STCW, assisted by education consultants.
- iv. Develop an employment and hiring scheme in conjunction with the school administration and the civil service authorities or whichever agency has authority over employment matters.
- v. Develop qualification and selection guidelines incorporating testing and evaluation measures for the hiring of prospective faculty members.
- vi. Prepare a written proposal for the shipping companies explaining the employment program and the implication for the whole MET and relevance to the revised STCW and the ISM Code.

Maritime education and training needs concerted support from the government, the school and the shipping companies. MET institutions must initiate the programs necessary to bring about change, while the government and shipping companies must ably provide assistance.

The instruction system with the employment program for the faculty presents the groundwork to combine efforts for a new and genuine program for Maritime Education and Training.

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**COURSE : COASTAL PASSAGE PLANNING**

**AIM :** *The student will be able to plan a coastal passage as an essential segment of a whole voyage plan and carry out practical preparation resulting in a safe and economical route.*

**DURATION : 30 HOURS - 3 ½ DAYS**

**LECTURE : 12 HOURS**

**PRACTICAL  
ACTIVITY : 15 HOURS**

**SIMULATOR  
EXERCISE : 3 HOURS**

**INSTRUCTORS : ACTIVE MERCHANT  
MARINE OFFICERS  
(SECOND MATES)**

**PARTICIPANTS : INCOMING SECOND MATES  
ACTIVE SECOND MATES FOR  
UPGRADING  
UNDERGRADUATES ( BY GROUP  
ARRANGEMENTS)**

## COASTAL PASSAGE PLANNING

*(as an upgrading course or an instruction unit supporting the main curriculum)*

### INTRODUCTION

The course is a more specific segment of passage planning dealing with essential procedures and methods in the preparation of a coastal route with the use of nautical and meteorological information specially significant to plan itself. The whole course will focus on the stages of route planning and the decisions the planner has to make considering all the aspects of safety, ship performance, local conditions, navigation system in place and the need for an alternate procedure of navigation/maneuver; the contingency plan. It will increase awareness to standard procedures of planning, conduct and monitoring of a coastal passage consistent with safety.

The course serves as an upgrading course for a practicing second officer and an appropriate preparatory study for an officer new to the tasks and functions of a second mate as the navigation officer. It is assumed that participants have a complete prior knowledge of navigation, ship stability, seamanship, meteorology and ship handling. These knowledge areas will find frequent applications throughout the course both in the theoretical and practical class activity. It can also be taken by nautical students on their final year of study but must have completed a year of shipboard training.

The team of instructors is composed of licensed merchant marine officers practicing in the capacity of second mates as navigating officers aboard ocean going vessels on international coastal route.

Pre-worked tasks will consist mainly the class activity with assignments and group exercises. The course is delivered totaling to in class lecture hours and individual or group practical activity. Practical and theoretical assessments will be given during and after the completion of the course.



**COURSE : COASTAL PASSAGE PLANNING**

**AIM : The student will be able to plan a coastal passage as an essential segment of a whole voyage plan and carry out practical preparation**

<b>OBJECTIVES</b> The student should be able to :	<b>CONTENTS</b>	<b>Learning Activity</b> <b>T A S K S</b>	<b>DURATION</b>	<b>RESOURCES</b>	<b>ASSESSMENT</b>
<b>1</b> Appreciate the importance of a planned coastal route and recognize the relevance and advantage of available information from nautical publications, weather messages and the characteristics of own ship and its equipments.	Analysis and evaluation of accidents due to inadequate planning/ failure to plan and use available information. Description of a ship's characteristics and its equipments	Lecture / case study analysis / video	1 hour lecture 1 hour video	video film/ case study materials / statistical data	Assignment /case study
<b>2</b> Explain the procedure of coastal route and contingency planning..	Procedure of coastal and contingency planning.	Lecture / Group Exercise/ work model presentation	1 hour lecture 1 hour group /ex	Manual and Guide to Coastal Planning with Contingency Preparation	Continuous assessment Group work /practical
<b>3</b> Understand the relevance of information derived from nautical publications and distinguish its use.	List of the nautical publications and its use and description of the information derived from them.	Lecture / Individual in-class work - Information gathering from N.P.	1 hour lecture 1 hour class work	Relevant and up to date N.P. used on the job/ list of nautical information and corresponding sources.	Open book individual class work
<b>4</b> Analyze and interpret weather information and notices.	Explanation of synoptic chart and symbols with theoretical and practical interpretation.	Lecture/	1.5 hour lecture	Meteorological manual and guides for the mariner	Open book individual class work

APPENDIX 1

5	Identify and interpret relevant coastal information on the chart.	Description of chart coastal information.	Lecture / Open book individual classwork.	1 hour lecture 1 hour class/work	Charts and guide on chart signs and symbols. US/ BA	same as above
6	Use the maneuvering and shiphandling information of own ship.	Use and purpose of maneuvering and shiphandling information of ships.	Lecture / classwork / assignments	2 hours lecture 1 hour class/work	Data of model ships and its maneuvering/ shiphandling characteristics	examinations and assignments
7	Plot courses and waypoints	Coastal chartwork plotting.	Lecture / practical exercise	4 hours lecture /practical exercise	Charts, plotting equipments, worked coastal plan for exercise	continuous assesment / practical exercise
8	Plot clearance bearings and ranges	Coastal navigation. Position fixing and check through turnpoints.	Lecture / individual plotting work.	1 hour lecture/ 2 hours plotting work	same as above	same as above
9	Prepare a contingency plan.	Definition and explanation of procedures for the preparation of a contingency plan.	Lecture / video / group exercise	3 hours lecture /video /group exercise	video / Recommendations and Guide on Contingency Planning	
10	Select the safest and shortest route based on the following: Own ship <ul style="list-style-type: none"> <li>• present stability condition</li> <li>• maneuvering and shiphandling characteristics.</li> <li>• cargo</li> <li>• navigation equipment</li> </ul> Coastal Navigable waters: <ul style="list-style-type: none"> <li>• depth of water</li> <li>• traffic density</li> <li>• navigation system and aids</li> <li>• tidal and meteorological condition</li> <li>• traffic separation schemes</li> <li>• passage routing regulations</li> <li>• chart scale availability and up-to-dateness</li> </ul>	Description of various stability conditions and its effect on ship behavior underway.  Description of ship's maneuvering and shiphandling characteristics in relation to available searoom. Description of accuracy and availability of navigation equipments. Explanation of regulations regarding coastal route & cargo carriage, TSS Explanation of the effects of tidal and meteorological conditions to navigation. Significance of chart scale, up to dateness of charts, depth of water and traffic density	Lecture (all points) / video / practical demonstration / Group work ( Case study situations as exercise scenario) / Debriefing	1 whole day activity	Worked coastal plan with all the nautical publications/ ship's data/ scenario information / situation requirements/ specimen chart passage guide and recommendations / ship's routing guide/ Rules of the Road/	Group exercise and presentation

**COURSE DURATION: 30 HOURS OR 3.5 DAYS**

This course can be offered to undergraduates as an instruction unit to support or supplement the main curriculum. It will effectively sort out the general knowledge gained by students from the main curriculum. It will provide specific practical instructions through tasking used extensively to focus on skill development and competency in performing shipboard work/job functions. This is similar to the model instruction scheme presented in the paper. Both use specific situations in actual work situations to provide relevance, regular update of instruction contents and most importantly the "specifics" in training procedure.