DEVELOPMENT AND ENHANCEMENT OF SUCCESS CRITERIA IN GLOBAL MARITIME EDUCATION AND TRAINING

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ABSTRACT

Accomplishment of continuous improvement can only be achieved by taking into account the minimization of prospective defects that could result due to management and operation level non-compliances in maritime education and training institution. Decision-making and implementation of principles should be continually reviewed to ensure the quality objectives are in process at training institutions. The major factors that are affecting the actual process of training institution's quality are mostly caused by impairment of teaching methods, not properly defined learning and understanding levels for students, and the inadequate administrative level course programs and curriculums.

These factors could activate educational effectiveness independently or simultaneously interrelated. Then this could lead to increase the number of corrective actions in a complex manner when the psychological factors begin to deal with the training process as well. A scientific approach shall be compulsory to resolve and prevent the training defects for achieving quality at Maritime Education and Training (MET) institutions.

It is also explained that academic staff potential backgrounds and their knowledge integrity with the application of maritime field of studies play a significant role to ensure the quality of graduates. In this study, the general terms of non-compliance management in training and education is proposed. In this respect, the importance of statistical techniques and evaluation methods are clearly emphasized. The outputs of this study are proposed to general discussion and review with the other Maritime Higher Education and Training Institutions on a worldwide basis.

Consequently it is also proposed to carry out similar studies for the other institutional member of IAMU, achieving the enrichment of sampling techniques and the combination of smooth and effective maritime training and education quality.

KEY WORDS: Maritime Education and Training, Statistical Technique, Academic Staff Proficiency

1. Introduction

For the assurance of maritime safety and environmental pollution protection objectives, STCW 95 Convention requires quality standards for all training institutions in accordance with regulation I/8 (IMO. 1995). The existing regulation requires that the effectiveness measurements should be carried out at all levels of the training institutions. In addition to that for the establishment quality management system standards in maritime training and education, it suggests to utilize recognized academic accreditations or quality standards body or Governmental agencies while defining the criteria of independent registration or certification body.

The main objective of the quality standard is to train and certify the crewmembers in an efficient continual improvement approach complying with the requirements of IMO Conventions such as SOLAS, MARPOL, STCW, COLREG, LOADLINE and ILO amendments etc.

It is obviously seen that, quality assurance of a MET institution becomes much more complicated when safety, environment and quality management criteria need to be integrated into the existing dynamic processes of a training institution while defining the knowledge, understanding, skills and competence. Assessment activities of

all MET institution's Management and Operational Levels on a worldwide basis put other crucial constraint caused by different national backgrounds.

The quality management terminology needs to explained in terms of maritime education and training prior to define the requirements of STCW-95 A-I/8. In this consideration the relationship between supplier and customer additionally the product that is provided by the supplier should be indicated in order to define the assurance of quality in the general terms of quality management literature.

Actually the maritime student is not a product. The product is the education of the student. In the manufacture of this product, as with any other product, it is essential that the worker (student) be an active participant in the design and creation of the product. The student, who is the person who stays with the learning process longest, should learn to become the comanager of his or her education. This means, according to the tenets of quality management, that the student should be involved, consciously and with skill, in the continuous improvement of the processes that create the product. The customers for the education of the maritime student are several. They are, in order of importance,

1. The maritime student, who must live with the product for the rest of his or her life. The student must become the co-manager of the production of the education and, having such a personal stake, must be considered first when attempting to define what it means to have quality in education.

2. The maritime student's parents and immediate family who, in many instances, are paying for the product and might also live with the results for the rest of their lives.

3. Potential employers who will rely on the education of the student after graduation to achieve the purposes of their enterprises.

4. Society at large, which pays a substantial proportion of the cost of the education and requires the future participation of the student as a citizen in the operation of government, as a contributor to the general welfare of society, and as a taxpayer who will support the education of future generations of students.

2. Identification of 'Quality' Concept and Various Expectations from MET(s)

After defining the basic interrelationship between supplier and customer, it is needed to define special boundary conditions of MET. In shipping business the management of training and education can be considered as the technical and the commercial management of maritime activities. The new regulations or rules that will be established by IMO have to be taken into account as a research work and the requirements of new rules have to be amended in relevant department curriculum in an efficient manner. As well as the Port State Control parameters and the effects of these parameters in shipping environment cause rapidly positive change improvements of ship management. As a result lecturer's academic research has to point out port state control inspection results and the classification society's survey requirements that complies the statuary certification of vessels. From the Commercial side of ship management, the charterer's complaints and the condition of clauses in charter party directly affects the claim handling process. The marine casualties or cargo damages that have the direct significant impact in training needs must be considered.

The maritime education and training can be defined as a set of interdependent processes such as teaching, learning, researching and resources including human, material and information that function harmoniously to achieve specified educational objectives in the means of ensuring marine safety and the protection of environment.

In this aspect, the maritime student's role during his or her education plays a significant role, while obtaining the outputs of requirements that is mentioned in STCW-95 Convention A-I/8. The management of quality and the assurance of customer satisfaction could only be defined in a sufficient manner when all specifications and the boundary conditions of the product is clearly defined and well managed.

The training and education concept can be analysed in four categories for determining the general expectations and reaching to customer satisfaction philosophy.

a. Knowledge, which enables the people to understand what they learn in relation to what they already know (Bloom, 1996). Knowledge is both practical and theoretical. Theoretical knowledge provides the people with the ability to generalise from unique instances. With theoretical knowledge, people can accumulate long years of experience such as twenty years. Otherwise, with only practical knowledge, people will have only one year repeated twenty times.

b. Know-how, which enables people to do and how to act. Know-how takes people past merely understanding. Know-how enables people to put knowledge to work (Bloom, 1996). Know-how differs significantly from knowledge. Knowledge can be organised into intellectually tight compartments, and these compartments may be taught as a subject on to themselves. Know-how, on the other hand, requires the purposeful organisation of knowledge from many different areas of learning. As know-how is extended to higher and higher levels of accomplishment, it requires extension to more and more areas of knowledge. When teaching know-how, it is impossible to put bounds on the areas of knowledge, which will be encompassed.

c. Wisdom is the ability to distinguish what is important from what is not (Spanbauer. 1987). Wisdom enables people to set priorities on how to use resources of time, energy, and emotion.

d. Character, as Stephen Covey has said, is a combination of knowledge, know-how, and wisdom coupled with motivation (Bloom, 1996). People often recognise the development of character by certain character traits, among which might be listed as: honesty, initiative, curiosity, truthfulness, integrity, cooperativeness, ability to work alone, ability to work in groups, self-esteem. It is up each MET institution to identify what to include in each of these four categories. It appears that in maritime education and training, attention is given only to the first of the four categories, with the last two not even given lip service.

In maritime education the lecturers often believe, that at the university level their sole duty is to develop knowledge and pass it on to the next generation. The development of the student's character is none of their business.

The list of knowledge that students are expected to acquire is usually a composite of what is required for accreditation and what the MET institution decides itself. In general, the accrediting authorities should pay attention to the development of either wisdom or character in accordance with the goals for education in the new century like CAEB, ABET, CHEA etc. In this respect, the training and education system recognised the existence of a number of supplier, customer relations, as shown in Table 1.

Table 1. Customer - Supplier relations in Education and Training

Customer	Supplier	Services
Students	Teachers	System Management Curriculum Design Counselling Leadership Materials and Equipment
	Administrators	System development and analysis Materials and equipment
	Faculty Boards	Policy
Teachers	Administrators	Materials and equipment
Parents	Faculty system	Knowledge, wisdom, know-how and character of student
Industry	Faculty system	Knowledge, wisdom, know-how and character of graduates

3. Principals of Managing Quality in Training Environment

3.1 The difference between features and quality

In the application of quality principles, it is important to distinguish between the concepts of features and quality.

Features are what the lecturer put into the product to distinguish it from other products and to appeal to the people for whom the product is intended. The kinds of knowledge and know-how that are included in the curriculum represent the features of the educational program. A MET institution may boast, for example, the excellent laboratories and workshop facilities for student use or may tout its computer facilities and internship program with industry, these are features. Quality, on the other hand, has to do with the way the features are delivered. Laboratories may be unkempt, equipment may not always work, the instructions may be poor, the internship in industry may be just an excuse to send the students away for a time and allow them to earn some money while the institution consults.

3.2 The difference between teaching and learning

Teaching occurs when the lecturer show the student how he or she solve a problem. Learning occurs when the student figure out how to solve the problem. Quality management in education should be concerned with the improvement of processes, teaching and learning. Learning can never be separated from the motivation to learn. One of the most powerful principles of learning is this. Lecturers therefore should pay great attention to creating a healthy situation in which the students feel a need to know. A common mistake in teaching is to create a need to know through fear, for example announcing an important test to be given in the near future and emphasising that grades will be strongly dependent upon the results. This is the aspect of education that made Einstein says that it was only after his education that he could begin to learn (Gallagher and Mary, 1993). Edwards Deming is explicit on this point and says that fear is destructive of education. At best it produces conditioned reflexes. At worst, it generates cynicism and disgust with education (Gallagher and Mary, 1993).

3.3 The role of tests and examinations

Quality leaders in world commerce have eliminated the need for final inspection, so should the aim of academia be to eliminate the need for final examinations in education (Deming. 1986). Final inspection used to be the method whereby a manufacturer attempted to assure the company and its customers that the product was fit for use. It seemed like a reasonable approach, and, for most educators, the concept of a final examination seems rational. In industry it is found that reliance on final inspection increases cost, produces inferior products, and masks the in efficiencies of the process.

As one who has been an executive and has had to rely on the education of employees to produce better, more competitive products, what every engineering executive will tell that most of the employees do not know how to make use of the materials they studied in school. Most use only a very small fraction of what they have been taught. The efficiency of the teaching and learning process is low education, for most students, is getting past the next examination. For example when the teacher asks, "Are there any questions?" and the first question is always, "Is this material going to be on the test?" Many educators are beginning to understand the following principle with regard to examinations.

The only legitimate purpose of an examination is to enable the lecturer and learner to decide what to do next. What is implied in this principle is that the learning process should be a process of constant improvement in the acquisition of knowledge, know-how, wisdom, and character. The assessments should be designed to provide feedback to both the student and the lecturer as a means to improve the processes of teaching and learning. The student should use the feedback to improve the learning process. The lecturer can use the information to help the student improve the way the student learns. Since each student may have a different style, students should be encouraged to perform tests and to measure the results of different approaches.

The lecturer should use the feedback from all students to assess the effectiveness of the teaching process and to improve it. At the beginning of the semester, the lecturer should discuss with the entire class the list of competencies and the level of mastery expected for each competency. The students should participate in the discussion of each competency; how they, themselves, will know their level of competency; how they will demonstrate it; how the lecturer will assess it; and what the lecturer will do to help them achieve it.

4. Establishment of Quality Activities in MET Institutions

Quality activities are necessary because their successful implementation will enable MET institution to:

- react quickly to customer needs. By determining customer expectations and surveying satisfaction, MET

Institution can become more responsive to the needs of its customers.

- focus limited resources on activities that truly satisfy customer needs. With data and information regarding customer satisfaction areas MET institution can eliminate services that are not key drivers of customer satisfaction.
- make improvements in a systematic way. Engaging in the problem solving process will enable MET institution to analyse facts and base actions on facts and test results, thereby becoming more effective organisation.
- engage and use the creative abilities for all members. An effective quality implementation strategy in higher education will involve all community members in the continuous improvement and change process.

Focus on improving processes when results are unacceptable, MET institution can flowchart, troubleshoot, and modify the processes that deliver those results. In industry, a focus on the product is perhaps the most straightforward application of total quality because product characteristics are relatively easy to measure, monitor, and improve. Support services are slower to adopt quality management principles. In higher education, it is seen that progression in the opposite direction. The product of education is delivered in the curriculum. Curriculum is the domain of the MET institution who may resist change. Results can be difficult to measure.

As a result the supplier and the customer relationship and the customer expectations need to be investigated in more detailed approach. For this reason it is essential to define the customer of higher education and training institution. For this purpose the customers of higher education are illustrated in Fig. 1 in terms of internal and external environment.

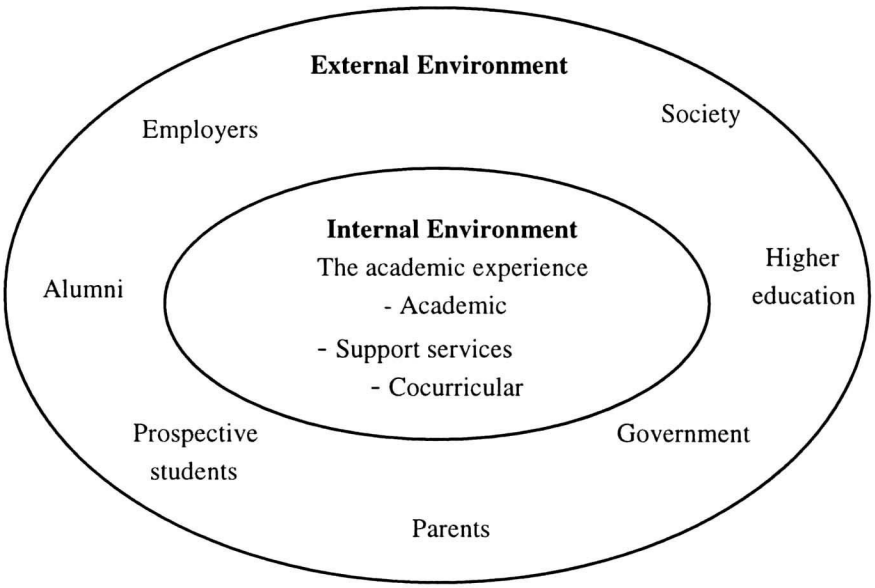

Fig. 1 Customers of higher education in terms of internal & external customer

As Fig.2 details, what is required is a twofold quality process, one that addresses not only basic offerings (curricula), but encompasses administrative processes as well. By understanding how MET institution can deliver enhanced service (by determining what MET institution's customers would like to see in the future). Eventually what was initially an enhanced service will become part of either the basic offering or support service in order to yield higher levels of customer satisfaction. This also will enable the institution to provide products or services that competitor institutions do not currently offer, which yields competitive advantage.

Adopting total quality necessitate will give up ownership of the curriculum by the MET institution. It will require consideration and accommodation of the needs of multiple customer groups. No longer can MET institution simply say the curriculum is the exclusive domain of the institute. MET institution will need to develop and modify curricula according to input, data, and information from customer segments, including students, employers, and parents. In addition, MET institution will need to be cognizant of the connection between the

classroom and co-curricular student development opportunities.

Professional service providers must develop more effective strategies to engage the professionals in the adoption and implementation of total quality. The classic implementation strategy in industry is a top-down approach. With this strategy there is typically a full-scale, organization wide total quality launch. Training is conducted, teams are launched, and all employees are expected to be involved within a relatively short period of time.

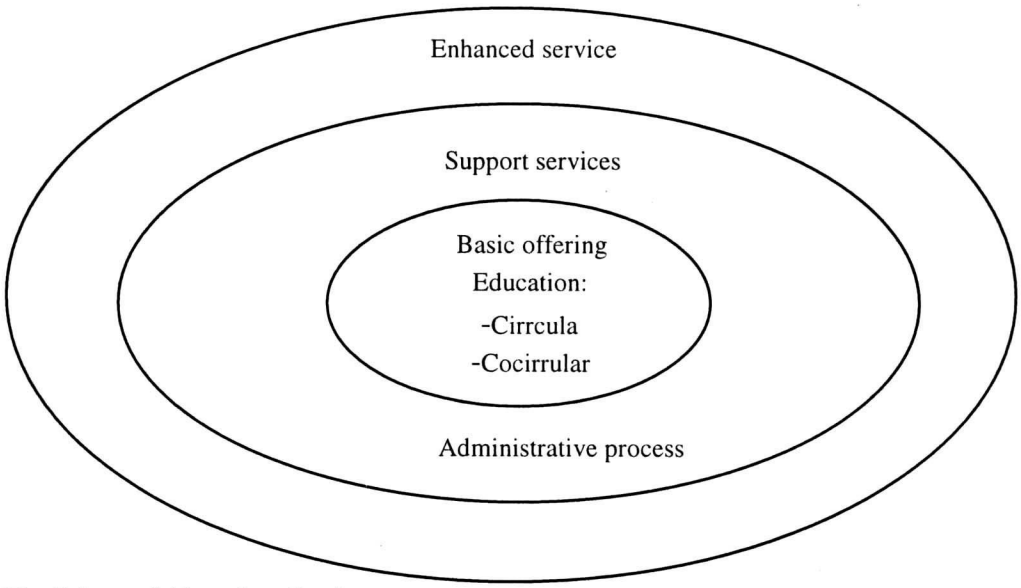

Fig. 2 A two-fold total quality focus

A main goal of the quality department in MET institution is the development of an organizational infrastructure to facilitate total quality implementation. The model, to be detailed for Maritime Education and Training, using the Shiba's approximation. Specific elements of each of the infrastructure areas are as follows.

1. Goal setting involves articulating what MET institution want to achieve with respect to total quality. This includes results as well as process related goals. This can be achieved through the incorporation of quality goals into the current evaluation system and preparation of a strategic plan for quality that includes specific goals for the next specified terms.

2. Organization setting involves deploying the necessary resources for implementation. This could involve setting up a department who reports to the highest level in the organization.

3. Training and education involve enabling people with tools and techniques. Decisions must be made regarding the content and length of training based upon the individual needs of the institution. A significant proportion of the training is dedicated to effective meeting skills, in order to enable a more disciplined and effective process for meetings.

4. Promotion involves, newsletters, and other written materials as well as visual displays and promotional events to pique interest and enthusiasm. MET institution can also submit information on quality initiative to the student and employee newsletters on a regular basis.

5. Diffusion of success process is a mechanism to learn from others and includes communication of specific means and results, the methodology applied by particular teams, and so forth.

6. Diagnosis and monitoring involves a plan-do-check-act (PDCA) cycle of the overall total quality initiative, which allows modification if necessary. As a result of initial PDCA, MET institution can start working more closely with the cabinet on inspecting the process and furthering team motivation. Additional training opportunities in response to employee needs can be developed.

QFD (Quality Function Deployment) is an approach to operationalising the concept of customer focus for an entire product or service line in an organization. The QFD process ensures that customers' needs, expressed in customers' own language, become the basis for definition of a product or service. These needs are translated into operationally defined characteristics, with target values and detailed plans for achieving those values. QFD's purpose is to ensure that quality, as demanded by the customer, is incorporated into each stage from definition to delivery of the product or service (Axland. 1991).

Introduced by Yoji Akao in the late 1960s, QFD was used in Japan in the early 1970s by Mitsubishi and Toyota to improve the quality of their products (Robinson et al. 1991). Because of its success in Japan, American companies recently have shown a growing interest in QFD.

At this point, MET institution has to decide to focus attention on one of the broadly defined customer demands, realizing the effort required to address each demand would be significant. Although it is important to eventually attempt to address all customer-identified demands, initially one or two priority demands should be targeted for immediate additional analysis. In setting priorities, it must be considered the relative importance of each demand to the customer, the degree to which the organization currently is succeeding in meeting the demands, and the interrelationships among demands. The goal is to focus first on the one or two customer demands that will result in the greatest perceived and actual improvement in service.

To assist in setting priorities, it is useful to consider relationships among the broad groups of demands identified. One way to understand these relationships is to construct an interrelationship digraph. Fig.3 displays the interrelationship digraph for broad demanded student characteristics.

Notifying the category "understanding of real-world issues" has four arrows pointing to other categories. This suggests that if changes could be made to improve this category, these changes would affect four other categories: "ability to analyse and synthesize," "ability to recognize and solve problems," "knowledge of competitive strategies," and "renaissance people." Thus, based on its relationships with other customer demands, "understanding of real-world issues" is assigned a high priority.

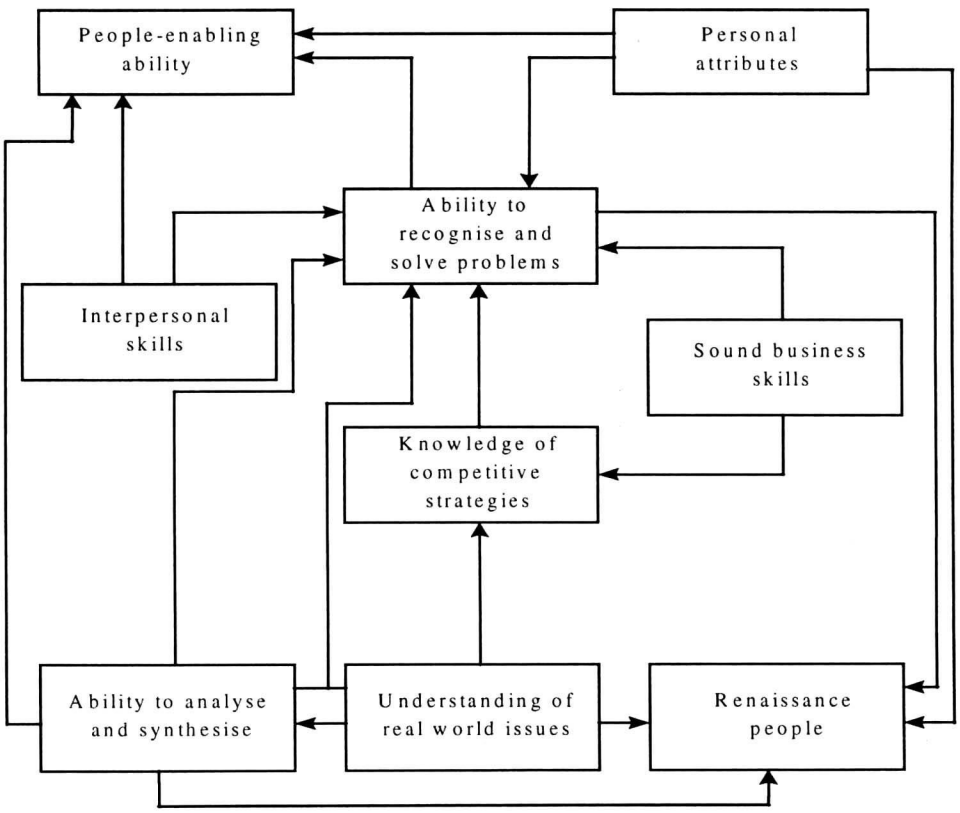

Fig. 3 Interrelationship digraph for broad demanded student characteristics.

5. Results and Discussions

As a result QFD is a process by which customer requirements are translated into design features, specifications, and operational targets. Customer-perceived value drives the process from beginning to end. In this study it is illustrated how to determine broad customer demands and how to use these broad demands as a basis to derive more detailed requirements. It is shown how to develop measurable characteristics that are correlated with the detailed demands and how to summarize the correlation's between the derived measurable values and the customer demands.

Finally, it is indicated how to summarize all this information in a manner that is useful for development of improvement plans. This is only the beginning of a process of continuous improvement. Each subsequent contact with the customer is another opportunity for the supplier to re-examine the product or service in light of customer requirements and to make changes as needed.

The strength of Quality Function Deployment comes from its ability to capture a customer's needs and to make them drivers of all processes, from design to delivery of a product or service. By its nature, QFD involves the MET institution seeking to bring about change, enabling individual members to discover ways to contribute to the improvement of a product or service. Customer needs and perceptions of quality change, requiring the supplier to inquire and listen, examine again and again.

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