

CHAPTER 5 – SUMMARY AND CONCLUSION

5.1 Summary of results:

In India the maritime education and training, especially marine engineering education had been carried out and controlled by the government. It was only in 1997 that private operators were allowed to start such institutions. TMI therefore started functioning in 1998. Today there are about 12 private institutions and one government-run institution, which conduct four-year marine engineering program in the country. In this short period TMI is already recognized as a premier marine engineering institution and is acknowledged and accepted by almost all the global shipping companies that engage Indian marine engineers at the induction stage.

This study covered all aspects of the operation of a MET institution, especially TMI. The collection of information on the expectations of the shipping industry from a MET institution, vide questionnaire A, has been acknowledged and complemented by many industry professionals. This was probably the first time when such exercise was done. Similarly the analysis of the perceptions of the shipping companies on the quality of service received from TMI; vide questionnaire B, provided excellent feedback from the main stakeholders. The comparison of the two data resulted in calculation of different gaps that exist between the expectations and perceptions. These are given in Figure 4.2.

82.9% of the respondents preferred their marine engineers from a dedicated four-year marine engineering degree program. This validates and confirms the importance of this program. 90.2% acknowledged that marine engineering is both education and training. This confirms that both knowledge and skills are necessary for a good marine engineer. Furthermore all round development of the students is also necessary.

The admission is an important function and decides on the quality of the intake. 53.7% of the respondents preferred an entry level test by the MET institution whereas 34.1% preferred selection on the basis of PCM marks; 17.1% preferred selection on the basis of 12th class aggregate marks; and 14.6% preferred interviews by the MET institution. On an overall basis 73.2% of the respondents preferred an institution with an elaborate selection process. The selection methodology at TMI has a combination of all these methods and

can construe to be covering the needs of the customers. 56.1% of the respondents wanted the MET institution to inform the shipping company about the methodology adopted for selection. Informatively shipping industry personnel join the interview panel at TMI.

Many of the other institutions do not have the system of an entrance examination and it is possible that the DGS will make this compulsory in near future. Such online test was started in TMI from 2001. An analysis of seven batches that have joined TMI since 2001 was carried out. No significant correlation was observed between the marks in 12th class in Physics, Chemistry and Mathematics and the marks obtained in the online admission test. However, it was seen that this correlation was higher in the case of students from CBSE board than students from other boards. The correlation for different state boards was less (Figures 4.3).

An institution can only be as good as its teachers. A system of calculating the faculty teaching potential was developed (Section 3.7). This is based on the academic qualifications of the faculty, their teaching and industrial experience and initiatives taken for up-gradation. This figure for TMI was calculated to be 30.87%. The areas for improvements were also identified.

The issue of design of curriculum was also addressed. For better clarity a curriculum based on GLOs and SLOs is suggested. Furthermore use of Bloom's Taxonomy is suggested so that the curriculum is specific and meaningful.

The in-process results during the different semesters for the four-year program were studied. The GPAs after the first semester were compared with the final CGPAs after four years. For the students admitted in 2000 improvement was noticed in case of 75% of the total students. This increased to 84.9% in students admitted in 2002 and 88% for the students admitted in 2003. The highest increase in CGPA was in 2000 (2.7 out of a maximum CGPA of 10). This reflects that the academic level of students is continually increasing during their stay in TMI. This was also compared for the students who joined in 2006 and have presently completed four semesters (Figure 4.11).

The final results were also analyzed. It is observed that number of distinctions have increased from 6.1% in 2002 (first batch) to 12% in 2007. Similarly the number of students getting first division has increased from 29.3% to 57.3%. The number of second

divisions has reduced from 64.6% to 30.8% during the same period. This again reflects improvement in the academic standards.

The data of five batches was analyzed to establish if there was any correlation between the performance at the time of admission and performance in the four-year program. No clear correlation was established though some correlation was seen for students of CBSE board (0.31 ~ 0.42) and Maharashtra state board (0.27 ~ 0.45). It was also observed that students who drop one or two years after 12th for preparation of competitive examinations do well in the admission test and also perform better in the four year period.

Use of control charts was demonstrated (Figures 4.15 and 4.16). Use of such charts allows identification of non-performing students so that remedial measures can be put in place.

One important aspect of the study was to obtain feedback from the faculty on the different areas of the functioning of TMI. This included leadership and governance; customer focus; measurement and analysis; staff focus; process management; and process outcomes. Their overall satisfaction was also calculated and the multiple regression equation is given as follows:

$$\text{Satisfaction} = 1.86 - 0.861 (\text{leadership and governance}) - 0.375 (\text{customer focus}) + 0.485 (\text{measurement \& analysis}) + 1.01 (\text{staff focus}) - 0.027 (\text{process management}) + 0.375 (\text{process outcomes}).$$

It can be observed that factors like staff focus; measurement and analysis; and process outcomes have a significant effect on the satisfaction level of the teachers.

TMI is still a young institution and the alumni are still getting settled in their career. In the study however, views of some alumni were taken. 88.6% of graduates felt that TMI had prepared them well for their career. Almost all respondents indicated that they are proud of TMI. Some areas for improvement were also identified.

The four-year marine engineering program is compulsorily residential. The feedback from parents therefore becomes an important feature in quality management. The analysis of this data indicates that 87% parents would recommend TMI to others. This reflects on

the overall satisfaction of the customer. Areas for further improvement were also identified.

The quality of teaching is paramount in an institution. Recognizing this TMI arranges different workshops during semester breaks for improving teaching skills. The feedback from students is taken every semester and a numerical value is calculated for every teacher. Over a period of different semesters this provides the trend of performance of teachers.

Use of different tools of TQM was demonstrated for the functioning of library, hostel, workshop etc.

5.2 Conclusion:

Maritime education and training is a very exclusive and specific activity as the graduates work on ships. The Indian marine engineers are in substantial demand globally and their knowledge and skills are acknowledged. With the improvement in our economy more options are available to the youth. Seafarers from other countries are also working towards getting such jobs. This scenario therefore requires that not only the quality of our marine engineers improved but also efforts are made to make young people aware about this fine career.

The MET institutions, though maintaining quality management systems and certified under ISO 9001:2000, need to implement the requirements in earnest. Laszlo (83) states that there are few 'paper certificate' holder of ISO 9000 standards certification. These have somehow got certified though they are not strictly following the requirements. These have to undergo a substantial culture change from being deceptive to being open and thereafter from the quality assurance approach to the quality management approach. As per the requirements of the ISO 9000 standards the institutions do have their policy and mission statements. However as per Evans (39) the vision and mission statements are worthless if the organization is not continuously aiming to improve its performance in the eye of its customers.

The management commitment must be complete. The leadership should demonstrate their belief in this philosophy. The financial considerations should also be understood. Activity

based costing, in conjunction with quality costs analysis should be implemented and the results would in provide an overall benefit to the organization

Different tools and techniques of TQM have been used in this study. Most of these are already implemented in TMI and the other would be implemented shortly. The sincere use of the PDCA cycle will result in continual improvement. It is hoped that other MET institutions also take initiative in implementing TQM so that Indian seafarers and especially the marine engineers stay in demand globally.

At the beginning of the study following three hypotheses were made:

1. *“A properly developed and organized selection process is necessary for recruiting students who can be subsequently molded during the educational and training process to a good product.”*
2. *“There is a relationship between the admission performance and the subsequent performance during the program in the MET institute.”*
3. *“Total quality management can be applied in the field of maritime education and training in general and in the area of marine engineering education in particular.”*

As per the work concluded and documented in chapters three and four, and the summary of results given in section 5.1 it can be adequately confirmed that this hypotheses No. 1 and 3 are validated. As regards to hypothesis No. 2 it is difficult to establish any significant trend at this time and the hypothesis is not validated.

In can therefore be concluded that TQM can be implemented in the MET sector and the benefits will accrue for all the stakeholders.

5.3 Recommendations:

The MET sector, being part of the vibrant shipping industry, is mature enough to adapt TQM philosophy. MET institutions do need to use the philosophy of PDCA cycle continuously so that expectations of all stakeholders are considered.

The tools and techniques of TQM can be used in academic activities, and also in all aspects of operations of a MET institution, including hostels, extra-curricular activities, and other student services.

Some recommendations for TMI and other MET institutions are appended below:

5.3.1 Recommendations for TMI:

This study has provided the author with an opportunity to use different TQM techniques in the operations of TMI. The implementation of TQM has already started in TMI. It is however, necessary that more detailed work is done in this area. The management has demonstrated sufficiently its support and commitment towards this initiative. The leadership is committed. The faculty and other concerned members are responsive and willing. The road towards quality is not easy and it takes time to achieve the desired goal. However, it can be done by the involvement of all concerned. This unique initiative of TMI can be a modal for other marine engineering establishments in the country.

5.3.2 Recommendations for other MET institutions:

An institution desiring to introduce TQM may adapt a model on the basis of guidelines from different quality awards. Dale (27) recommends the model from Baldrige National Quality Award. This covers the following as indicated in section 2.8.1:

Leadership

Information and analysis

Strategic quality planning

Human resource development

Management of process quality

Quality and operational results

Customer focus and satisfaction

Based on the organization and the activities of the institution different weights may be allotted to above areas. A quantitative statement can be developed indicating current situation. The projected target for next few years may be fixed and the PDCA cycle used to achieve the target.

The changes for incorporating TQM would be extensive and the technique of Business Process Re-engineering (BPR) may be adopted to bring necessary changes. BPR involves identification of key objectives of the institution, redesigning different processes and sub-processes and eventually aim to attain the set objectives. This may mean totally obliterating processes and starting over again, moving away from outdated and inefficient processes.

For effective process re-engineering the view of the teaching staff, various stakeholders on the services that is provided by the institution have to be taken. This mechanism allows identification of strengths and also the opportunities for improvement. The environment, indicating opportunities and threats, have also to be considered.

The involvement of all concerned, especially the teaching staff, is extremely important. They need to be suitably empowered so that they contribute by not only doing their tasks but by being involved and contribute substantially in the operation of the institution.

Allen (3) had collected information and views from all concerned in some institutions of higher education that were involved in implementing process re-engineering. He found the motion of academic freedom ever present and an attempt to re-engineer teaching and learning be undermined by unclear accountabilities.

The teaching and learning system are now under pressure to change. This pressure is due to the change in environment with increased requirements and expectations from the industry, changing student profile, increased competition etc.

Allen (4) refers to a survey conducted in USA with diverse organizations, both manufacturing and service, where there are usually two types of rewards, namely extrinsic and intrinsic. Extrinsic rewards refer to the pay or compensation whereas intrinsic are those that do not deal directly with money. Intrinsic rewards are important motivators as these provide a feeling of accomplishment. It was found in the study that organizations that used intrinsic reward system extensively reported significantly higher levels of performance. The study therefore concludes that organizations implementing TQM should also provide non-monetary forms of recognition like certificates, letters of appreciation etc at an appropriate occasion.

Eminent and distinguished quality guru Dr. Deming gave 14 points, which provide the framework for implementing TQM. The essence of these points should be translated for educational area. It is important that each of these points is discussed and deliberated by the senior management of the institute. The techniques for application of these can then be decided and eventual process of implementation begins in earnest.