

WORLD MARITIME UNIVERSITY

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**THE MARITIME EDUCATION AND TRAINING SECTOR:
BEYOND TRADITIONAL QUALITY MANAGEMENT**

By

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Myanmar

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fulfillment of the requirements for the award of the degree of

MASTER OF SCIENCE

In

MARITIME AFFAIRS

(MARITIME EDUCATION AND TRAINING)

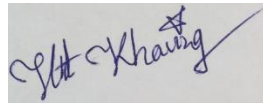
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DECLARATION

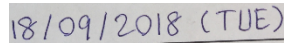
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The contents of this dissertation reflect my own personal views and are not necessarily endorsed by the University.

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Date:



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ACKNOWLEDGMENTS

Allow Yourself

(A poem)

Allow yourself to dream

And when you do dream big.

Allow yourself to learn

And when you do learn all you can.

Allow yourself to laugh

And when you do share your laughter.

Allow yourself to set goals

And when you do reward yourself as you move forward.

Allow yourself to be determined

And when you do you will find you will succeed.

Allow yourself to believe in yourself

And when you do you will find self-confidence.

Allow yourself to lend a helping hand

And when you do a hand will help you.

Allow yourself relaxation

And when you do you will find new ideas.

Allow yourself to love

And when you do you will find love in return.

Allow yourself to be happy

And when you do you will influence others around you.

Allow yourself to be positive
And when you do life will get easier.

Adapted from a poem by Catherine Pulsifer (2009).

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ABSTRACT

Title of dissertation: **The Maritime Education and Training Sector: Beyond Traditional Quality Management**

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According to Regulation I/8 of the International Convention on Standards of Training, Certification, and Watchkeeping for Seafarers (STCW), 1978, as amended, all maritime education and training (MET) institutions must have a quality standards system to achieve their education and training objectives, as well as the related standards of competence. For this reason, most of the MET institutions are using the International Organization for Standardization's (ISO) standard 9001:2015 in accordance with their national or regional standards. In May 2018, the ISO in Switzerland published the new standard 21001:2018 management system for educational organizations.

This dissertation is discussing the usage of the ISO 21001:2018 in maritime education and training institutions. Future possibilities are briefly examined with the quality management principles along with the necessary recommendations. This study analyses the four stages of the quality management system (planning stage, operating stage, checking stage and improving stage) based on the new ISO 21001:2018 through case studies, a research questionnaire, a literature review, and an oral survey conducts during the World Maritime University's field study trips.

The usage of the ISO 21001:2018 in MET institutions is examined in this context which can provide educational products and services capable of meeting learners' and other beneficiaries' requirements to sustain the United Nations' Sustainable Development Goal No.4: Quality Education. The conclusion is drawn based on the results of the analyses and research questionnaires and the recommendations are made according to the case studies on MET institutions in different regions.

KEYWORDS: STCW Regulation I/8, ISO 9001:2015, ISO 21001:2018, UN's SDG-4.

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LIST OF ABBREVIATIONS

CAR	Corrective Action Request
EOMS	Management System for Educational Organizations
IMO	International Maritime Organization
ISO	International Organization for Standardization
MET	Maritime Education and Training
METI	Maritime Education and Training Institution
PDCA	Plan-Do-Check-Act Cycle
PESTLE	Political, Economic, Social, Technological, Legal and Environmental Factors Analysis
QMS	Quality Management System
SDG	Sustainable Development Goals
STCW	International Convention on Standards of Training, Certification, and Watchkeeping for Seafarers, 1978, as amended
SWOT	Strengths, Weaknesses, Opportunities and Threats Analysis
UN	United Nations
WMU	World Maritime University

CHAPTER 1 – INTRODUCTION

Activities of Maritime Education and Training (MET) are vital for the normal functioning of the maritime sector. The International Maritime Organization (IMO) elaborated on the issue of the Maritime Sustainable Development Goal No.4 Quality Education, which is “to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” in accordance with the IMO’s International Convention on Standards of Training, Certification, and Watchkeeping for Seafarers (STCW). IMO aims to achieve inclusive and high-quality education by providing training activities, particularly through its technical cooperation programs and its global maritime training institutions (IMO, 2017).

It is a fact that a maritime education and training institution (METI), which has adopted and implemented a good quality management system is critical to the success of the maritime education and training sector. According to Regulation I/8 of the STCW Convention, 1978, as amended, quality standards are defined as “fitness for purpose” and this can be summarized as follows:

1. Providing systems and processes to assure the quality of the maritime training and assessment;
2. Extending this to incorporate all certification, endorsement and revalidation activities; and
3. Introducing the additional element of accountability by means of the independent evaluation and associated reporting requirements (IMO, 2017).

Most of the METI in developing countries are using the international organization for standardization's standard 9000 series and the STCW, 1978, as amended in accordance with their national own standard. In the near future of the 21st century, various new high technologies are coming such as Semi-Autonomous and Fully Autonomous Ships; there is also the possibility that the so-called "E-MET Institutions" will be used instead of "traditional" MET Institutions. In any case, Quality Management will play a very important role in maritime education and training sector (Nakazawa, 2018).

ISO 9001:2015 is the standard that can set out the requirements for a quality management system and can help the organization to be more efficient and improve customer satisfaction. To fulfill this, the MET institution needs to deliver the knowledge and skills based on the STCW Convention to trainees efficiently and effectively.

A MET institution needs to design the respective curriculum and syllabus based on the STCW Code A which is mandatory and Code B which is guidance adopted by IMO, as well as other related IMO model courses for the guidance purpose (e.g. model course 7.02 for management level engineering officer and model course 7.04 for operational level engineering officer).

Regarding STCW Regulation I/8, the MET institution needs to consider the Quality Standards which is the backbone of every educational and training activity. According to SDG No. 4 of UN: Quality Education, the MET institution also needs to consider the Quality Assurance in higher education and the relevant accreditation process (Nakazawa, 2018).

In 2018 May, ISO 21001 was published by International Organization for Standardization (ISO) in Switzerland. It is a common management tool to provide educational products and services to meet the requirements of learners and other beneficiaries. This management system is aligned and based on ISO 9001:2015 through a high-level structure application. It is mainly focused on the interaction between an educational

organization such as institutions, learners and other related interested parties. The ISO points out that:

“All requirements of ISO 21001 are generic and intended to be applied to educational organizations that provide, share and facilitate the construction of knowledge through teaching, training or research, regardless of type, size and the product and service provided. The standard, therefore, applies to the management system of an organization utilizing a curriculum to provide, share and transfer knowledge” (ISO21001, 2018).

The aim of this dissertation is mainly to explore how maritime education and training institution could establish a Quality Management System (QMS) based on ISO 21001:2018 – Educational Organizations Management System (EOMS) in order to achieve harmonization at the global level. Another aim is to identify the challenges when upgrading a transition from ISO 9001:2015 version to ISO 21001:2018 version of the MET system. Finally, the appendix section includes research questionnaires used during the research effort and the STCW Regulation I/8 – Quality Standards, as a reference.

1.1. Research Questions

The research questions addressed are:

1. What are the key benefits of using ISO 21001:2018 in METI based on quality management principles?
2. What are the important considerations on the transition of ISO 9001:2015 version to ISO 21001:2018 version in METI?
3. How to effectively implement ISO 21001:2018 in METI aligned with Regulation I/8: Quality Standards, STCW Convention, 1978, as amended?

1.2. Research Methodology and Source of Information

This dissertation has used both Qualitative Method and Quantitative Method. It is divided into two main sections:

- Section I: Quality Management Principles in accordance with the ISO 21001:2018
- Section II: Four stages of Educational Organizations Management System (EOMS): Planning, Operating, Checking and Improving stages.

In Section II, the sub-questionnaires that were prepared according to the following clauses of ISO 21001:2018 are explained.

- Clause 4 – Context of the organization
- Clause 5 – Leadership
- Clause 6 – Planning
- Clause 7 – Support
- Clause 8 – Operation
- Clause 9 – Performance evaluation
- Clause 10 – Improvement.

The remaining clauses such as Clause 1: Scope, Clause 2: Normative references, and Clause 3: Terms and definitions were not considered as very important because they differed regarding the MET institutions' nature and policy. However, these clauses are briefly described in Section I.

In Section II, the following topics are thoroughly examined through a quality standards system:

- All training
- Assessment of competence
- Certification including medical certification

- Endorsement and revalidation activities carried out by non-governmental agencies and entities under its authority
- The qualifications and experience of instructors and assessors
- A sample evaluation
- A sample report containing the results of the evaluation to the IMO.

The main questionnaires and the sub-questionnaires were sent to specific MET institutions and other relevant administrative bodies. The criteria for choosing the MET institutions were as follows:

- The MET institution should have a recognized leadership role in its national maritime industry
- The MET institution should have the relevant manpower and/or trainees.
- The respective National Maritime Administration should be an IMO Member State.

The questionnaires were made based on the existing quality assurance in the MET system of developing countries such as Myanmar, Vietnam, South Africa, and the Philippines.

In addressing the above research questionnaires, a critical analysis was also made by using internet resources, IMO's documents, World Maritime University's library along with some interviews to combine the views from different stakeholders or interested parties located in various different regions of the world.

The discussion is conducted based on the eleven quality management principles according to ISO 21001:2018 – Educational Organizations Management System:

1. Focus on learners and other beneficiaries
2. Visionary leadership
3. Engagement of people
4. Process approach

5. Improvement
6. Evidence-based decisions
7. Relationship management
8. Social responsibility
9. Accessibility and equity
10. Ethical conduct in education
11. Data security and protection.

This dissertation did not consider to get any information related to the financial background of the MET institution because it is only focusing on Quality Management System of the MET institution and the national maritime administration. If the targeted MET institution assumed that some information was confidential, this study did not seek further information. Indicative examples include the results of the individual trainee, or trainees' biodata, etc.

Conclusions were drawn based on the analyses and findings by using all of the above methods and principles, and recommendations are provided in the light of those findings. Additionally, the questionnaires designed and applied in this dissertation in order to seek the documented information and records of the targeted MET institution and the respective national maritime administration, as well as the results are included as Appendices at the end of this dissertation.

1.3. Literature Review

The literature review is dealing with quality management principles, the new ISO 21001:2018 – Educational Organizations Management System and STCW Convention Regulation I/8: Quality Standards into the METI management process.

Resources were based on the World Maritime University Library, library databases, and in-class lecture presentations. Additionally, web-based resources mainly relating to the International Organization for Standardization (ISO) official website and other relevant quality classification societies' official web pages were incorporated as part of various analyses and the development of answers relating to the research questions.

According to the questionnaires, interviews, and findings related with the Quality Management from this dissertation, the expected outcomes provide the following benefits for the future MET institution and the national maritime administration:

- Increased customer satisfaction
- Development and improvement of the capability of the organization and its people to deliver desired results
- Enhanced involvement of people in improvement activities
- Optimized performance through effective process management, efficient use of resources, and reduced cross-functional barriers
- Enhanced ability to anticipate and react to internal and external risks and opportunities
- Improved decision-making processes
- Increased capability to create value for interested parties by sharing resources and competence and managing quality-related risks.

1.4. Key Assumptions and Potential Limitations

The key assumptions and potential limitations for this dissertation were:

- Difficulties in interviewing and contributing the questionnaires – In some occasion, the delivering of the questionnaires and/or the interviewing will be a major issue. For example; not willing to fill out the questionnaires or not willing to reply or keeping the information as confidential.
- Time constraints – The dissertation period is far too rigid within 39 weeks.

1.5. Use of Words/Definitions

1.5.1. Quality

“The standard of something as measured against other things of a similar kind; the degree of excellence of something” (Oxford, n.d.). “Fitness for Purpose” has been a widely used approach by quality agencies. It can also define as a degree to which a set of inherent characteristics fulfills requirements (ISO9000, 2015).

Quality Management – All activities of the overall management function that determine the quality policy, objectives, and responsibilities, and implement them by means such as quality planning, quality control, quality assurance and quality improvement within the quality system. Quality Assurance – An integrated system of activities involving planning, quality control, quality assessment, reporting, and quality improvement to ensure that a product or service meets defined standards of quality with a stated level of confidence. Quality Control – The overall system of technical activities whose purpose is to measure and control the quality of a product or service so that it meets the needs of users. The aim is to provide quality that is satisfactory, adequate, dependable and economical (ISO8402, 1994).

1.5.2. Management system

A management system can address a single discipline or several disciplines. The system elements include the organization’s structure, roles, and responsibilities, planning and operation. The management system is also a set of interrelated or interacting elements of an organization to establish policies, objectives, and processes to achieve those objectives. The scope of a management system includes the whole of the organization, specific and identified functions of the organization, specific and identified sections of the organization, or one or more functions across a group of organizations (ISO21001, 2018).

1.5.3. Education and training

“Education – the knowledge and development resulting from the process of education. Training – the skill, knowledge, or experience acquired by one that trains” (Merriam-Webster, n.d.).

“Education – the process of receiving or giving systematic instruction, especially at a school or university. Training – the action of teaching a person a particular skill or type of behavior” (Oxford, n.d.).

In this study, education and training refer to the maritime-related learning process.

1.5.4. Educational organization

An organization whose core business is the provision of educational products and educational services. The organization can be defined as a person or a group of people that has its own functions with responsibilities, authorities, and relationships to achieve its objectives. The educational product is a tangible or intangible good used in pedagogical support of an educational service. It may be produced by any parties including learners. The educational service is a process which supports acquisition and development of learners’ knowledge, skills and attitudes through teaching, learning or research (ISO21001, 2018).

1.5.5. Competence

“The ability to do something successfully or efficiently” (Oxford, n.d.).

“A sufficiency of means for the necessities and conveniences of life” (Merriam-Webster, n.d.).

The ISO defines competence as the ability to apply knowledge (facts, information, principles or understanding acquired through experience or education); skills (set of know-how that allows a person to master an activity and succeed in accomplishing a task; skill can be cognitive, emotional, social or psychomotor); and attitude (manner of thinking, feeling or behaving) to achieve intended results (ISO8402, 1994).

1.5.6. Documented information

Documented information can be in any format and media from any source. It is required to be controlled and maintained by an organization and the medium on which it is contained. It can refer to the management system including related processes, information created in order for the organization to operate (documentation) and evidence of results achieved (records) (ISO21001, 2018).

1.5.7. Leadership

“The action of leading a group of people or an organization” (Oxford, n.d.).

“The act or an instance of leading; capacity to lead” (Merriam-Webster, n.d.).

Top management has the power to delegate authority and provide resources within the organization who can demonstrate leadership and commitment with respect to the EOMS. If the scope of the management system covers only part of an organization, then top management refers to those who direct and control that part of the organization (ISO21001, 2018).

1.5.8. Risk

The risk is an effect of uncertainty which is a deviation from the expected – positive or negative. The risk is often expressed in terms of a combination of the consequences of an event (including changes in circumstances) and the associated “likelihood” of occurrence. Uncertainty is the state, even partial, of deficiency of information related to, understanding or knowledge of, an event, its consequence, or likelihood (ISO21001, 2018).

1.5.9. Audit

An audit can be an internal audit (first party) or an external audit (second party or third party), and it can be a combined audit (combining two or more disciplines) which is a systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which the audit criteria are fulfilled.

The detail of “audit evidence” and “audit criteria” can be found in ISO 19011. An internal audit is conducted by the organization itself, or by an external party on its behalf (ISO21001, 2018).

1.5.10. Continual improvement

Continual improvement is a recurring activity to enhance performance (the ability to fulfill requirements). The process of establishing objectives and finding opportunities for improvement is a continual process through the use of audit findings and audit conclusions, analysis of data, management reviews or other means and generally leads to corrective action or preventive action (ISO21001, 2018).

CHAPTER 2 – QUALITY MANAGEMENT PRINCIPLES

2.1. Quality Assurance and Quality Control

Quality Management is defined as all activities of the overall management function that determine the quality policy, objectives, responsibilities, and implement them by means such as quality planning, quality control, quality assurance and quality improvement within the quality system (ISO8402, 1994). The following table summarizes the different aspects of quality assurance (QA) and quality control (QC) within the framework of the quality management.

Table 2-1: QA vs QC

Aspects	Quality Assurance (QA)	Quality Control (QC)
Definition	A set of activities to ensure quality in the processes by which services or products are developed.	A set of activities to ensure quality in the products or services. The activities focus on identifying defects in the actual products produced or services provided.
Aim	To prevent defects with a focus on the process used to make the product or provide the service. It is a proactive quality process.	To identify and correct defects in the finished product or the given service. It is a reactive process.

Goal	To improve development and test processes so that defects do not arise when the product is being developed or the service is being provided.	To identify defects after a product is developed before release or a service is provided before the final stage.
How?	Establish a good quality management system and the assessment of its adequacy. Periodic conformance audits of the operations of the system.	Finding and eliminating sources of quality problems through tools and equipment so that customer's needs are continually met.
What?	Prevention of quality problems through planned and systematic activities including documentation.	The activities or techniques used to achieve and maintain the product quality, process and service.
Responsibility	Everyone in the organization involved in developing the product or providing the service is responsible for quality assurance.	A specific team is responsible for quality control that tests the product or monitors the service for defects.
Example	Verification of validation	Software testing
Statistical Techniques	When statistical tools and techniques are applied to processes (process inputs and operational parameters), they are called as Statistical Process Control (SPC).	When statistical tools and techniques are applied to finished products or provided services (process outputs), they are called as Statistical Quality Control (SQC).
As a tool	A managerial tool	A corrective tool

Summary	QA refers to the process used to create the deliverables and can be performed by a manager, client or even a third-party reviewer. Examples of QA include process checklists, project audits, and methodology and standards development. QA is generic and does not concern the specific requirements of the product being developed or the service being provided. QA activities are determined before production work begins or providing service begins and these activities are performed while the product is being developed or the service is being provided.	QC refers to quality related activities associated with the creation of project deliverables. QC is used to verify that deliverables are of acceptable quality and that they are complete and correct. Examples of QC activities include inspection, deliverable peer reviews, and the testing process. QC is about adherence to requirements. QC activities are after the product is developed or the service is provided.
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Source: ISO 8402 (1994).

2.2. Principles for Educational Organizations Management System (EOMS)

There are eleven principles for EOMS, which are listed below:

1. *Focus on the needs of learners and other beneficiaries:* this primary focus of EOMS considers the purpose to meet and exceed the learners and other beneficiary requirements and their expectations. The active engagement of the learners in their own learning process of the subject matter and the context in which the learning process takes place. The METI, learners, instructors, and other stakeholders in the wider context focus on the success of each learner.
2. *Visionary leadership:* this focus of EOMS engages all relevant interested parties in planning, documenting, and implementing the METI mission, vision and objectives. The leaders at all levels need to maintain the unity of purpose, strategic direction and create conditions which can support the employees to achieve the goals, aims, and objectives of the METI. The visionary leadership has the ability to cover competencies in change management as well (ISO, 2015).
3. *Engagement of people:* Engaging people is essential to enhance the capability that people at all levels throughout the METI who are empowered, competent and engaged in delivering value. Recognition, empowerment, and enhancement of competence facilitate the engagement of people in achieving the METI's quality objectives (ISO, 2015).
4. *Process approach:* Predictable outcomes and consistency are needed to achieve more efficiently and effectively when activities are managed and understood as interrelated processes that function as a coherent system, including input and output. Understanding how results are produced by EOMS enables the METI to optimize the system and its performance (ISO, 2015).
5. *Improvement:* Every successful METIs should have an ongoing focus on assessable and measurable improvement which can evaluate to directly fulfill the aims and goals of the METI.

6. *Evidence-based decisions*: Every decision should be based on the evaluation and analysis of the information and data that can produce the desired outcomes. Evidence-based decision making can be a complex process which always involves some uncertainty and multiple types or sources of inputs as their interpretation which can be subjective. It is very important to properly know the cause-and-effect relationships and potential unintended consequences (ISO, 2015).
7. *Relationship management*: The METI needs to manage their relationships with interested parties such as collaborating partners and suppliers for the purpose of sustainable success. Relationship management with its supplier and partner networks is of particular importance. Interested parties influence the performance of the METI (ISO, 2015).
8. *Social responsibility*: The responsibility of the METI through ethical behavior and transparency for the impacts of activities and its decision on the environment and the society that:
 - is in compliance with applicable consistent and law with international norms of behavior;
 - takes into account the stakeholders expectation;
 - contribute to sustainable development including health, quality education for all and welfare of society;
 - is integrated throughout the METI and practices in its relationship. This implies the willing inclusion by the business of environmental and social concerns in the economic (commercial) activities and their relationship with their stakeholders (ISO26000, 2010).
9. *Accessibility and equity*: Every successful METI are transparent, flexible, accountable, and inclusive in order to address learners' individual and special needs, abilities, interests, and backgrounds, creating an environment where learning activities are organized in a way that encourages learners to construct the knowledge either individually or in groups in an active way. Educators within

these METI facilitate and provide all educational products and services and opportunities to all learners in a manner that is equitable.

10. *Ethical conduct in education*: The ability of the METI to create an ethical professional environment where all interested parties are dealt with equitably, conflicts of interest are avoided, and activities are conducted for the benefit of society.
11. *Data security and protection*: All interested parties are able to interact with the METI in full confidence that they maintain control over their own data, and that the METI will treat their data with confidentiality and appropriate care (ISO21001, 2018).

2.3. Process Approach

The process approach involves the systematic definition and management of processes, and their interactions to achieve the intended results in accordance with the objectives, policy, and strategic plan of the METI. By using the plan-do-check-act (PDCA) cycle, management of the processes and the system as a whole can be achieved with an overall focus on risk-based thinking aimed at taking advantage of opportunities and preventing undesirable results.

The application of the process approach in an EOMS enables:

- the consideration of processes in terms of added value;
- understanding and consistency in meeting requirements;
- the achievement of effective process performance;
- improvement of processes based on an evaluation of data and information (ISO21001, 2018).

The following figure is an example of the educational effectiveness process assessment. Educators, employers, and the educational organization itself can be assumed as the sources of inputs into this single process. As the inputs, the results of knowledge assessing (e.g. tests, examinations, tutorials, etc.) and the information about learner performance (e.g. classroom activity, practical jobs, etc.) are monitored and measured by people who are under sources of inputs category. After the application of assessment methodologies of the educational effectiveness as the activities, the outputs will be the results of that assessment of the educational effectiveness which can deliver to those who are under the category of the receivers of outputs.

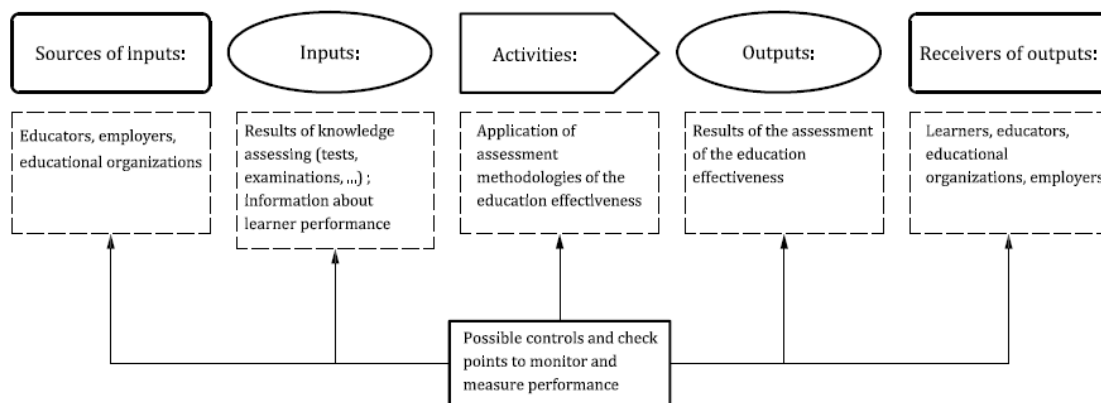


Figure 2-1: Schematic representation of the elements of a single process (assessment of the educational effectiveness process) (Source: ISO21001:2018)

2.4. Plan-Do-Check-Act (PDCA) Cycle

The PDCA cycle can be used in all processes and can also apply to the EOMS as a whole. The following figure describes how ISO 21001 Clauses 4 to 10 can perform in relation to the PDCA cycle.

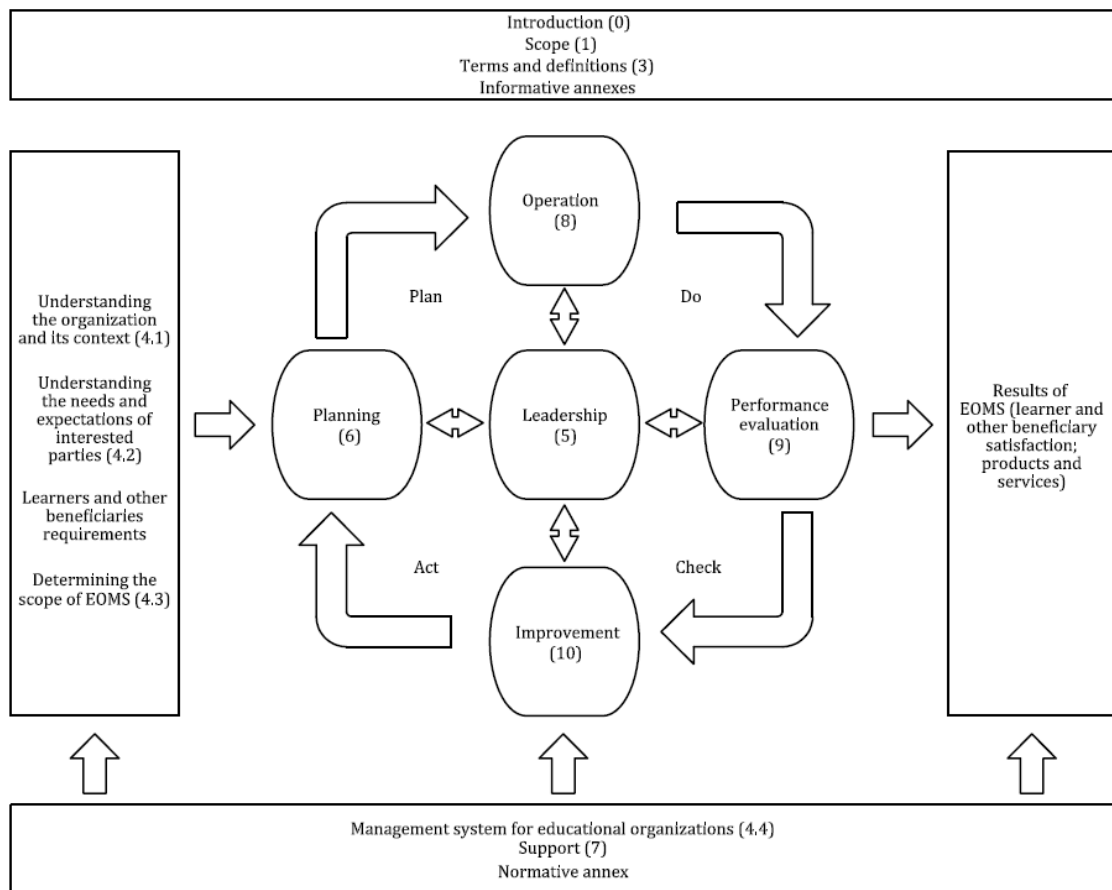


Figure 2-2: EOMS in the framework of ISO 21001 (Source: ISO 21001:2018)

In the above figure of EOMS in the framework of ISO 21001, the top box includes an introduction, scope, terms, and definitions which are not involved in the PDCA cycle but they all related to the EOMS of the METI. However, the bottom box which includes the management system for educational organizations and the support is involved in the input stage, process stage and output stage of the METI.

In the input stage, the METI needs to consider the external and internal issues, interested parties and the scope of the METI in accordance with the learners and other beneficiaries requirements. In the process stage of PDCA cycle, the leadership effects to planning,

operation, performance evaluation, and improvement aligned with the plan-do-check-act process. Lastly, in the output stage, the results of the EOMS including learners and other beneficiaries satisfaction on educational products and services need to be monitored and measured by the METI gradually.

Hence, the PDCA cycle can be briefly described as follows:

- *Plan*: establish the objectives of the system and its processes, identify and address risks and opportunities, and the resources needed to deliver results in accordance with learners' and other beneficiaries' requirements and the METI's policies.
- *Do*: implement what was planned;
- *Check*: measure and monitor the processes, and the resulting products or services against objectives, policies, requirements, planned activities and report the results.
- *Act*: take actions to improve performance as necessary.

2.5. Risk-Based Thinking (RBT)

According to ISO 9000, the risk is the “effect of uncertainty on an expected result” and an effect is a positive or negative deviation from what is expected. Risk can be positive as well as negative that “the term risk is sometimes used when there is only the possibility of negative consequences”. Risk-based thinking refers to a coordinated set of activities and methods that METI use to manage and control the many risks that affect its ability to achieve objectives. RBT replaces what the old standard used to call the preventive action.

RBT is essential to achieve an effective EOMS. The METI needs to plan and implement actions to address risks and opportunities which can establish to increase the effectiveness of the EOMS, to achieve improved results and to prevent negative effects. Opportunities can arise as a result of a situation favorable to achieve an intended result, e.g. a set of circumstances that allow the METI to attract learners and other beneficiaries, to develop

new products and services and to reduce waste or improve productivity (ISO21001, 2018).

To summarize, Risk-based thinking (RBT) is an element in the process approach and an input to management review. It is an element in the continual improvement process that is focused on prevention. It has to be demonstrated during audits; a risk register is documented information that validates an organization has done RBT (Deysher, 2015).

2.6. Organizational Mission, Vision, and Strategy

The EOMS policy statements provide the framework for the establishment of the EOMS objectives which are revised periodically to ensure the METI’s mission is efficiently and effectively accomplished through the continuous path towards the achievement of the METI’s vision. The EOMS policy statements are framed by the METI’s culture which includes the beliefs and values aligned with the EOMS principles. The relation of these elements is also known as a strategy (ISO21001, 2018). The following figure describes how EOMS strategy as related to mission and vision.

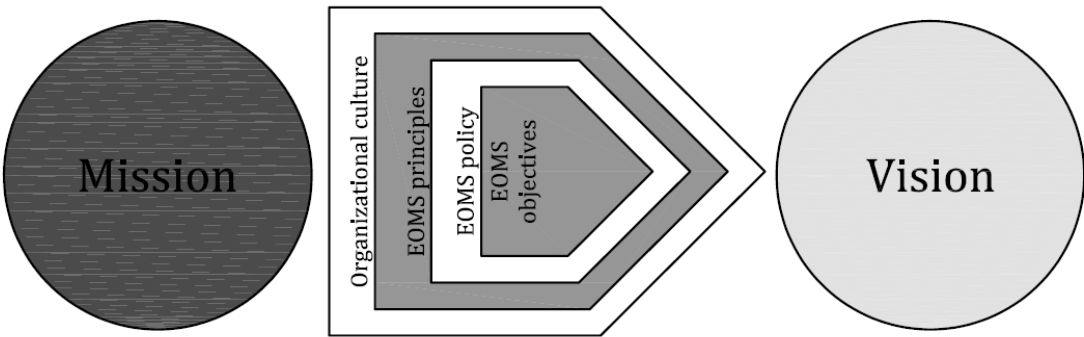


Figure 2-3: EOMS strategy as related to mission and vision (Source: ISO 21001:2018)

CHAPTER 3 – PLANNING STAGE

3.1. Context of Organization

3.1.1. Strategic Direction, External and Internal Issues

Firstly, the METI needs to carefully consider the external and internal issues which are related to its purpose, strategic direction and social responsibility that can affect its ability to achieve the intended results of its EOMS. Those issues can contain both positive and negative conditions or factors for consideration. The METI has to monitor and review information based on those external and internal issues (ISO21001, 2018).

Secondly, the strategic direction can be expressed by using documented information such as the METI mission or vision statement. It can be analyzed by using SWOT analysis: strengths, weaknesses, opportunities, and threats which are most common in planning strategic direction and PESTLE analysis: political, economic, social, technological, legal and environmental factors. Other approaches can also use depending on the size and complexity of METI operations such as asking “what-if” questions and brainstorming (Whittington, 2017).

External issues can consider based on political, economic, social, technological, legal, environmental, market, competitive and cultural factors depending on local, national, regional or international level. Internal issues can consider based on knowledge, performance, values, and culture of the METI. The following examples of external and internal issues are facing in some developing countries (Whittington, 2017).

The following table describes some examples of external and internal issues of METI.

Table 3-1: External and Internal Issues of METI

External Issues	Internal Issues
- Political stability, public investments, local infrastructure, international trade agreements - The economic situation, inflation forecast, money exchange rates, credit availability - Local unemployment rates, education levels, safety perception, working days and public holidays - New technology, professional code of ethics, patent expirations, materials and equipment - Trade union regulations and regulations related to an industry - Competitive market share, similar services, customer growth trends, supply chain relationship, market stability, market leader trends	- The overall performance of the METI - Infrastructure, working environment, organizational knowledge - Competence of employees, organizational behavior and culture, relationship with unions - Performance of EOMS, service provision capabilities, monitoring customer satisfaction - Rules and procedures for decision making, organizational structure

Source: Whittington & Associates (2017).

3.1.2. Interested Parties

According to their potential effect on the METI's ability to sustainably and consistently provide products and services, the METI needs to determine the interested parties and their requirements that are relevant to the EOMS. The METI also needs to monitor and review information about those interested parties and their requirements. The interested parties include learners, the staff of the METI and other beneficiaries. An indicative list of interested parties is provided via figure 3-1: Interested parties of METI.

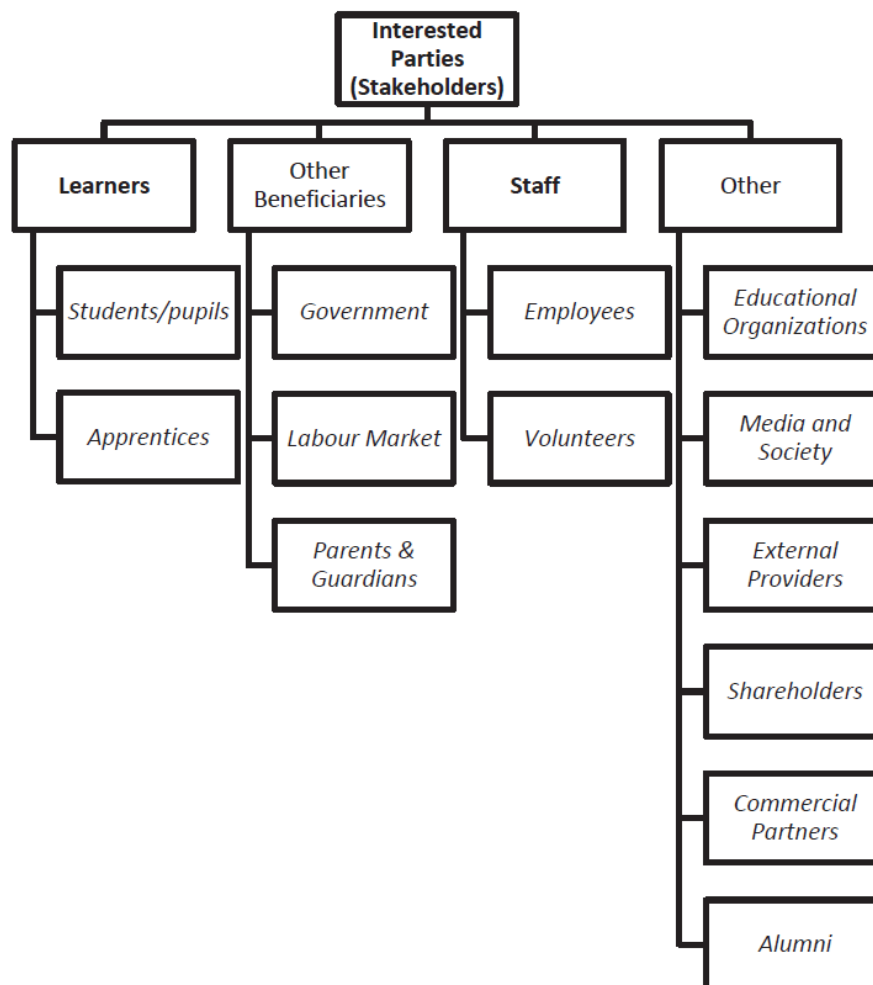


Figure 3-1: Interested Parties of METI (Source: ISO 21001:2018)

Under the category of “learners”, the term “students/pupils” covers marine cadets, college or university level students, or even management and operational level marine officers who are willing to develop their knowledge, skills, and attitudes at the METI. On the other hand, “apprentices” include maritime learners who are practically training in simulators and workshops.

Moving forward with the analysis of stakeholders, under the category of “other beneficiaries”, the term “government” covers ministries of education and transportation, maritime administration and public or regional authorities. The term “labor market” includes employers, seamen unions, manning agencies and shipping companies. The term “parents and guardians” covers all persons who can decide on behalf of learners if learners are underage. Under the category of “staff”, the term “employees” covers permanent or visiting professors, lecturers, instructors and staff who contracted with METI and hold a position within METI. The term “volunteers” includes persons who provide a service to METI without monetary recompense.

Finally, under the category of “other”, the educational organizations include both collaborating and competing METIs. The media and society contain those with a tangential interest in METI. The external providers cover suppliers and other external organizations providing outsourced services as IMO. The shareholders include owners of shares in METI. The commercial partners contain sponsors and shipping companies who jointly offer courses. The alumni include former students/pupils or apprentices of the METI.

Educators could be in the category of employees, volunteers or external providers. These interested parties may have more than one type of relationships with METI, for example, an employee within METI can be a researcher or a teaching assistant. The METI has to monitor and review information based on those interested parties and their requirements (ISO21001, 2018).

3.1.3. The Scope of the METI's EOMS

To establish its scope, the METI needs to consider the applicability and the boundaries of the management system. Again, it refers to the above-mentioned section 3.1.1: external and internal issues and 3.1.2: interested parties and their requirements, and further also needs to consider what kind of services or products will offer. This is very important that all services and products provided to learners by the METI must be contained within the scope of its EOMS.

The scope of the EOMS must be available and be maintained as documented information. The scope should cover the types of products and services, and provide justification for any requirement based on ISO 21001:2018 that the METI determines which is not applicable to its EOMS. Conformity should be claimed if the requirements determined as not being applicable, could not affect the METI's ability or responsibility to ensure the conformity of its products and services, and the enhancement of learners' and other beneficiaries' satisfaction (ISO21001, 2018).

3.1.4. Management system for educational organizations (EOMS)

The METI needs to establish, implement, maintain and continually improve the EOMS including the processes needed and their interactions in accordance with the requirements of the International Standard. The process should consist of the following:

1. *Required input and expected output*

The required input should contain the infrastructure of the METI, facilities, teaching aids, lecture notes, learners, instructors, and staffs. The expected output should be the learners who have been granted the completion certificates and the pass rate of the METI.

2. *The sequence of the process*

It should be considered based on the preparation of course and approval, admission process, monitoring and measurement including evaluation to instructor and course evaluation, pretest and examination, and the course completion process.

3. *Monitoring and measurement*

It can be considered based on the attendance monitoring including daily and monthly attendance, classroom activity marks, and assessment and examination marks.

4. *Resources needed*

The resources needed could involve preparing procedures such as HR management procedure, infrastructure and environment procedure, and organizational knowledge procedure which will be described in more detail in chapter-4: 4.1. Support section.

5. *Responsibility and authority*

The issue of responsibility and authority will be described in more detail in this chapter-3: 3.2. Leadership section.

6. *Risk and opportunity*

The planning of actions to address risks and opportunities will be described in more detail in this chapter-3: 3.3. Planning section.

7. *Evaluation*

The METI should analyze and evaluate appropriate data and information which will be described in more detail in chapter-5: 5.1. Performance evaluation section.

8. *Improvement*

The METI should continually improve the suitability, adequacy, and effectiveness which will be described in more detail in chapter-6: 6.1. Improvement section.

3.2. Leadership

3.2.1. Leadership and Commitment

The respective METI's policy must ensure that all interested parties' requirements are adequately understood, documented and thoroughly reviewed by competent personnel. The objective is to gain a clear understanding of the interested parties' requirements and to consider whether these can be met and agreed to terms and conditions (BSI, 2016).

The procedure of handling feedback and complaints is to provide for the educational organizations management system and to assign responsibilities for receiving and processing interested parties' feedback and complaints. This procedure applies to all interested parties' feedback and complaints, and also concerns for all departments in the METI (BSI, 2016). The following considerations should be carried out by the respective department of the METI:

1. Receiving and logging customer feedback and complaints

All customer communication, whether written or verbal, should be forwarded to the academic department and administration department. Verbal communication by phone is documented in a memo established during, or immediately following, the conversation with the customer. Verbal communication during the customer visit or meeting is to be documented in a meeting minutes and personnel attending the meeting are to be recorded for evidence. All customer feedback and complaints are recorded in a log maintained by the administration department (BSI, 2016).

2. Processing customer feedbacks and complaints

The administration department evaluates and classifies each complaint and then communicate the complaint to the concerned function. The relevant department and the function is responsible for the complaint, deciding how to respond to the customer and when applicable, what needs to be done to correct the problem for the customer.

3. *Corrective and Preventive Action*

The EOMS representative should review every customer complaint to determine whether it calls for an internal investigation and should be followed up with a formal corrective action request (CAR). When a corrective action is initiated, the CAR number should be registered in the customer complaints log. When customer returns lodged a complaint, it is to be evaluated, inspected and/or tested, and is handled and processed in accordance as Control of Nonconformity. Depending on the nature of the nonconformity, the responsible person will discuss with the responsible head of the department for a follow-up and requests for corrective or preventive actions (BSI, 2016).

4. *Records*

Every customer complaint either on a formal letter or on the METI prepared feedback reporting format is recorded in the customer complaints log. In general, records of complaint investigations are maintained by the department that conducts the investigation. For example, records of internal investigations may be merged with records of the corresponding corrective or preventive actions, which are maintained for EOMS.

3.2.2. Policy

The effectiveness of the policy needs to be reviewed annually when and where necessary for the continual improvement of the EOMS. The policy will be made available to all employees of the METI.

The policy must be related and provided the following considerations of the METI:

1. Respective METI's mission and vision
2. Purpose and context of the organization
3. A framework to set the METI's objectives

4. A commitment to satisfy applicable requirements
5. A commitment to continual improvement
6. Relevant pedagogical, didactic, scientific and technical developments
7. A commitment to satisfy social responsibility
8. A commitment to manage intellectual property
9. Needs and expectations of the interested parties (ISO21001, 2018).

The following policy example is defined based on the concept of ISO 21001:2018 – EOMS:

“The maritime education and training institution is committed to conducting its education and training affairs in such a way as to educate and train the highest quality of marine officers and marine engineers to meet the learners’ and other beneficiaries’ satisfaction”.

3.2.3. Organizational roles, responsibilities, and authorities

According to the organizational structure of the MET institution, the roles, responsibilities and authorities assigned are different. The top management of the METI should appoint an EOMS representative to ensure the following processes:

- the processes needed for the EOMS are established, implemented and maintained,
- monitoring the quality aspects of the operation of each department,
- reporting to the top management on the performance of the EOMS and any needs for improvement,
- promotion of awareness of customer requirements throughout the organization.

The following table describes the common roles so-called the “top management position” in most of the METI and their common responsibilities and authorities.

Table 3-2: Common roles, responsibilities and authorities in top management level

Role	Responsibility	Authority
Principal or Rector	- Formulate the quality policy - Make decision for role, responsibility and authority - Ensure smooth internal communication - Provide necessary resources - Issue and approve the properness and effectiveness of EOMS - Appoint responsible persons to conduct the appropriate tasks	- The highest authority in the organization - Approval of employment - Make judgments in order to secure finance and resources - Make decision on concerning matter that is not covered in EOMS and to act accordingly
EOMS Representative	- Ensure the EOMS is implemented, maintained and continually improved - Report to Principal the needs of improvement and coordinate communication with external parties on matters relating to the EOMS - Audit implementation and effectiveness of the EOMS - Develop quality plans and control plans - Initiate corrective and	- Assign duties to the internal audit team members to ensure effectiveness of the EOMS - Report to Principal on the performance of EOMS including needs for improvement - Arrange Management Review (MR) meeting agenda

	preventive actions - Handle customer feedback, complaints and non-conforming products and services - Coordinate document control activities - Identify and provide training needs for employee	
Head of Administration	- Manage office facilities and properties - Account management - Manage wages and welfares - Manage external and internal documents - Draw up staffs' training plan to ensure staff development and opportunities	- Employ and terminate the staffs except managerial position to ensure the effective resource management - Report to Principal
Head of Academic	- Ensure the effectiveness of entire education and training process - Handle learners' complaints - Take corrective action and preventive action against non-conforming training matters - Collect and control lecture notes and lesson plan	- When any non-conforming event of learner is found, warning notice to learner has to be issued - Report to Principal - If the non-conforming event of learner is a major item, meeting has to be

	- Prepare timetable and remind assigned lecturers in advance - Collect the assessment question and keys from lecturers - Control assessment papers and records - Collect the exam questions, keys and marked papers from lecturers - Prepare and control attendance and classroom activity documents	carried out to take any required action
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3.3. Planning

3.3.1. Actions to address risks and opportunities

When planning for the EOMS, the METI needs to determine the risks and opportunities that need to: provide assurance that the EOMS can achieve its intended results; enhance desirable effects; prevent or reduce undesired effects; and achieve improvement. Actions taken to address risks and opportunities should be proportionate to the potential impact on the conformity of products and services.

The following table demonstrates a limited number of examples to meet the requirements of risks and opportunities aspects by establishing strategic plan which can identify the risks with mitigation factors and conduct the strength, weakness, opportunity and threat (SWOT) analysis as follows:

Table 3-3: Examples of mitigation risks

No.	Risk Identification	Impact	Mitigation Measures
1.	Organizational budget	High	Adopt reducing expenses method
2.	Local competitors	High	Improve pass rate and advertising
3.	Insecurity (physical injury, accident, illness and etc.)	Low	Submitted medical leave form to principal and arranged to send clinic or hospital for medical treatment.
4.	Emergency Hazards (fire, earthquakes, outbreaks and etc.)	Low	Installation of firefighting equipment and training of staffs for emergency drills.
5.	Unpredictable course requirement changes by local authorities	Medium	Under the supervision of principal, the METI adopted to meet the new requirement changes.

Table 3-4: SWOT analysis example

Strength - Strong quality management system - Skilled and experienced manpower - Modern training infrastructure - Supported facilities for training - Achieved targeted exam pass rate	Weakness - Unequal ratio of permanent and visiting educators - Weak marketing for advertisements - Limited learners - High maintenance cost and expenses
Opportunities - Strong community relationships among METIs - Improved teaching techniques - Strong regional and global partnerships and collaborations	Threats - Increased market competitors - Learners' absent rate - Educators' skill development - Weak regional and global partnerships and collaborations

3.3.2. The METI's objectives and planning to achieve them

To achieve the better performance and results, the METI needs to establish educational organization objectives at relevant functions, levels and processes needed for the EOMS.

The objectives of the METI should:

- be consistent with the quality policy,
- be measurable,
- take into account applicable requirements,
- be relevant to conformity of products and services and to the enhancement of learner and other beneficiary satisfaction,
- be continually monitored,
- be communicated,
- be updated as appropriate.

When planning how to achieve those quality objectives, the METI needs to determine:

1. Educator's teaching technique has to be improved to achieve the targeted pass rate.
2. Capacity of staffs and facilities should be adequate to meet the learner and other beneficiary satisfaction.
3. Principal, head of departments, all instructors and staffs have responsible to achieve quality objectives.
4. The METI's quality objectives should be reviewed in management review meeting and revised if needed.
5. The results of quality objectives should be evaluated based on evaluation to educators' records and course evaluation records.

3.3.3. Planning of changes

When the METI determines the need for changes to the EOMS, the changes are carried out in a planned manner. The METI needs to consider:

1. The purpose of the changes and their potential consequences;
2. The integrity of the educational management system;
3. The availability and readiness of internal resources;
4. The allocation or reallocation of responsibilities and authorities;
5. The availability and readiness of external providers needed to implement the change (ISO21001, 2018).

3.4. Summary

To summarize this chapter, there were three main sections in the planning stage namely: context of the organization, leadership and planning. Further study on context of the organization, the METI should consider the strategic direction related with its mission and vision, as well as, the scope of the METI. The external and internal issues were also very important for the METI's operation which could be considered based on SWOT analysis, PESTLE analysis and "what-if" questionnaire. According to ISO 21001:2018, there were eight main aspects to continually maintain and improve the EOMS. As the second section of this chapter, leadership and commitment issues which are related with organizational roles, responsibilities and authorities should also be identified in accordance with the METI's EOMS policy. The final section of this chapter included the actions to address risks and opportunities; how to plan to achieve the METI's objectives; and the planning of changes if the EOMS needs some changes to improve efficiently and effectively. This planning stage is very important as a foundation of a quality management system before establishing the METI's EOMS.

CHAPTER 4 – OPERATING STAGE

4.1. Support

4.1.1. Resources

The METI should determine and provide the resources needed for the establishment, implementation, maintenance and continual improvement of the EOMS. The resources have to be sustainably enhanced:

- Learner engagement and satisfaction through activities that could improve learning and promote the achievement of learning outcomes;
- Educator and staff engagement and satisfaction through activities that could improve educator competences to facilitate learning;
- Other beneficiary satisfaction through activities that could contribute to the social benefits of learning.

The METI should determine and monitor which resources should be provided by external providers or internal resources. The METI should also ensure that a variety of accessibility requirements which are anticipated (ISO21001, 2018).

4.1.1.1. Human Resources

The purpose of this procedure is to adopt, implement and promote an effective HR management; to satisfy the manpower need of the METI; to develop its administrative and managerial competence and capability; and to ensure the provision of timely service of satisfactory performance.

This procedure should be applied to all HR related issues and should be concerned all teaching, administrative and support staffs employed by the METI.

1. *HR Management Policy* – The METI should develop to facilitate the process of finding qualified employees and choosing them among applicants. The main objective of the HR management policy is to prevent the individual right and social security of all employees who has been engaged with the METI.
2. *Recruitment and Selection* – The departmental heads must submit the proposal to the top management for the need of new jobs or replacement of existing job in their departments. For recruiting educators or staffs, relevant documents, records and references should be checked and verified by the top management. The top management should analyze the human resource plan taking into account as follows:
 - The number and categories of employees and job descriptions;
 - Personal specification and physical requirements;
 - General intellectual requirements
 - Attainments: qualification, education and experience;
 - Special aptitudes: mechanical skills/technical knowledge (ISO9001, 2015).
3. *Responsibility* – The administration department should plan to make a suitable arrangement for external recruitment through advertisements, employment agencies or other sources such as recommendations by alumni, etc. The interviewers have to select carefully the interested applicants to meet the METI functional requirements. The METI needs to maintain data and records of applicants due to the privacy right and needs to protect as confidential.
4. *Staff's employment agreement* – After hiring the staff for a long or short term contract basis, the terms and conditions for the employment of staff should be stated as a clear written legally enforceable agreement aligned with the local law. The agreement should be clearly stated the terms and conditions of employment including salary scale, allowance, entitlement to leave, health insurance and other

benefit packages for employee. The employees who signed an employment agreement should be given an opportunity to examine and seek advice on the agreement before signing, as well as other facilities as necessary to ensure that they have freely entered into an agreement with a sufficient understanding of their rights and responsibilities.

5. *Termination of agreement* – The termination of the agreement should be included the fixed date for its expiry, the conditions entitling to terminate it and the required notice period which should not be less than one month prior to termination.
6. *Salary* – All employees should be paid for their work regularly and in full accordance with their employment agreements. The salary should be calculated based on per hour of work. The METI should pay compensation to employee for overtime work and the hourly overtime rate should not be less than one quarter of the basic rate corresponding to the normal hour of work.
7. *Staff's performance appraisal* - The proper feedback should be allowed employees and the top management to intervene what appropriate actions to improve performance. The top management body determines who should receive pay increases. The top management may grant pay increase and bonuses based on merit (ISO9001, 2015).

4.1.1.2. Facilities

The METI should determine, provide and maintain the facilities which are suitable for human resources to support and enhance learners' development of competence. The METI also needs to ensure that the dimension of the facilities is adequate to the requirements of utilizing those facilities. The facilities for METI should be included buildings and grounds, equipment including hardware and software and the utilities that meet learner requirements. The facilities should be included for teaching, self-learning, conducting research, implementing knowledge, subsistence, and rest/recreation (ISO21001, 2018).

4.1.1.3. Environment for the operation of educational processes

The METI has to determine, provide and maintain the environment necessary for the operation of educational processes to achieve conformity of services. Some indicative examples could be staff party and holiday vacation to promote social dealing scale and psychological improvement; as well as, adequate lighting system and air-conditioning system at working environment for the physical improvement of employees and learners. (ISO21001, 2018).

4.1.1.4. Monitoring and measuring resources

When monitoring or measuring was used to verify the conformity of products and services to requirements, the METI should determine and provide the resources needed to ensure valid and reliable results. The resources provided should be suitable for the specific type of monitoring and measurement activities being undertaken, namely, adequate to the target, the type, method of educational delivery and duration of the educational service. The resources should be retained as appropriate documented information as well as an evidence of fitness for purpose by the METI's EOMS representative to sustain the performance of the organization (ISO21001, 2018).

When measurement traceability was considered by the METI to be an essential part of providing confidence in the validity of measurement results, the measuring resources should be verified and calibrated at specified intervals against measurement standards traceable to international or national measurement standards. The measuring resources should be safeguarded from adjustments, damage or deterioration that could be invalidated the calibration status and subsequent measurement results. If the validity of previous measurement results has been adversely affected when measuring equipment was found to be unfit for its intended purpose, the METI should take an appropriate action as necessary (ISO21001, 2018).

4.1.1.5. Organizational knowledge

Organizational knowledge is the knowledge specific to the organization; it is generally gained by experience. It is an information that is used and shared to achieve the organization's objectives. This should be maintained and be made available to the extent necessary. When addressing changing needs and trends, the METI has to consider its current knowledge and determine how to acquire or access any necessary additional knowledge and required updates (ISO, 2015).

Organizational knowledge can be based on: internal sources – the METI's top management has to establish and implement the staff duty rotation of all departments to gain the organizational knowledge; as well as, external sources – the METI has to arrange to attend the training courses for educators and staffs to improve their ability, experience and knowledge (ISO29990, 2010).

On the other hand, the METI also needs to provide learning resources which should be reflected the needs and requirements of learners, other beneficiaries and educators; should be reviewed at planned intervals to ensure they are up to date; and should be referenced and catalogued (ISO29990, 2010).

4.1.2. Competence

As a MET institution, it has to determine the necessary competence of persons doing work under its control that affects the performance and effectiveness of the quality management system, on the other hand, it requires to ensure that these persons are competent on the basis of appropriate education, training, or experience. Applicable actions can include, for example, the provision of training to, the mentoring of, or the reassignment of currently employed persons; or the hiring or contracting of competent persons (ISO9001, 2015).

4.1.3. Awareness

The METI should have an educational reimbursement policy for the staffs who can participate in seminars, conferences, and other forms of external training for their development of knowledge and skills. As an indicative example, the educators had an opportunity to attend the Instructor, Examiner and Assessor Training Course, on the other hand, the staffs also had a chance to study Public Communication Awareness Course or other relevant workshops or seminars held by national and international bodies (ISO9001, 2015).

The METI should encourage all employees to read maritime related articles such as IMO's published updated articles, books, magazines, etc. for the purpose of self-study to improve the performance of the institution. Based on the findings for this dissertation, the most important awareness issue was the training and familiarization with the EOMS to all employees. Most of the MET institutions did not establish or provide a policy to deliver the EOMS awareness training course to all personnel within the organization.

4.1.4. Communication

The top management of the METI should establish the procedure to ensure that appropriate communication processes within the organization and that communication takes place regarding the effectiveness and efficiency of the EOMS. The procedure should be covered but not limited to: issue of inter-office memos; through meetings; land-line and mobile phones; posting of newsletters on office notice boards; and internet webpages using social network such as Facebook or Messenger, etc. (ISO21001, 2018).

4.1.5. Documented information

The Principal or Rector of the METI should formulate the principle of quality policy and approve the quality documented information. The EOMS representative must maintain the quality documented information. The quality documented information is authorized and approved by the Principal or Rector. The EOMS should be issued as a controlled or uncontrolled document at the discretion of the Principal or Rector.

The documents are submitted for the Principal's approval and the status of the documents is clearly identified by stamping or printing (CONTROLLED) in red ink before issuing. Controlled documents are always subjected to review, revise and update as required. The Uncontrolled documents are only valid at the time of issue and no further follow-up action is required.

The forms and checklists are needed to record the data while implementing the process of the EOMS. The forms and checklists have to be reviewed for effectiveness and compliance with the requirements of the department by the EOMS representative or the head of the department. The forms and checklists also need to be monitored and controlled by the head of the department concerned.

The work instruction should be prepared and described in the EOMS and it should be issued under various formats such as posted notices, instruction sheets, and internal standards, etc. Work instructions are normally requested by the department which is using them. The EOMS representative should prepare the work instructions and issue them as controlled documents. The head of the department needs to ensure that the requirement is understood and ensure that the most updated version is the one in use. The EOMS representative also needs to verify that work instructions are maintained under the document control policy.

4.2. Operation

Depending on what kind of educational products and services will be delivered by the METI, the operation of the EOMS will also be varied to fulfill the learners' needs and requirements. Even though performing the different EOMS based on ISO 21001:2018, the following procedures and considerations have to be planned, implemented and controlled as appropriate.

1. Operational planning and control
2. Requirements for the educational products and services
 - Determination of requirements
 - Communication of requirements
 - Changes to requirements
3. Design and development of the educational products and services
 - Planning
 - Inputs
 - Controls (Program, Curriculum, Assessment)
 - Outputs
 - Changes
4. Control of externally provided processes, products, and services
 - Type and extent of control
 - Information for external providers
5. Delivery of the educational products and services
 - Control of delivery
 - Identification and traceability
 - Property belongings to interested parties
 - Preservation
 - Protection and transparency of learners' data
 - Control of changes

6. Release of the educational products and services
7. Control of the educational nonconforming outputs (ISO21001, 2018).

4.3. Summary

To summarize this chapter, there were two main sections in the operating stage namely: support and operation. Further study on support, the METI should consider the resources needed including human resources (HR), facilities, environment for operation of the educational processes, monitoring and measuring resources, and organizational knowledge. The competence, awareness and communication issues were also very important for the METI's operation. According to ISO 21001:2018, the documented information process was also an important issue to continually maintain and improve the EOMS. As the second section of this chapter, the operation issues were described however those issues were varied according to the METI's nature so that not explained in detail in this dissertation. This operating stage is very important as a main driving body of a quality management system after establishing the METI's EOMS.

CHAPTER 5 – CHECKING STAGE

5.1. Performance Evaluation

5.1.1. Monitoring, Measurement, Analysis, and Evaluation

In accordance with the local authority's guidance and based on IMO's STCW Convention, the maritime education, training and examinations for marine officers and marine engineers, the METI should apply a continuous assessment system during the approved the education and teaching period (IMO, 2005).

5.1.1.1. Satisfaction of learners, other beneficiaries and staff

The purpose of this procedure is to compile and analyze the feedback and complaints from learners and other beneficiaries to enhance the level of their satisfaction. The complaints from them are a common indicator but no complaint does not necessarily imply high satisfaction. Even when the respective requirements have been agreed with the customer and fulfilled, this does not necessarily ensure high satisfaction (ISO10002, 2014).

Information and data on learners' and other beneficiaries' satisfaction are acquired by collecting feedback from them and analyzing their behavior which includes:

- *Learners' and other beneficiaries' complaints* – Although the level of satisfaction cannot be fully relied on complaint, solving the matters in complaint can enhance the level of satisfaction. Learners' and other beneficiaries' complaints,

spontaneous expressions of satisfaction, and other unsolicited feedback from them need to be collected and processed by the respective department in METI. The resulting data should be periodically compiled and analyzed by the EOMS representative, and then it should be discussed at management review meetings (ISO10002, 2014).

- *Evaluation to educators by learners* – Based on marks provided by learners, the educator evaluation average can be calculated. If educator is not receiving positive feedback, the issue has to be discussed with the Principal or the Head of academic department to promote his/her teaching style and teaching method. This process can also enhance the level of satisfaction. A comment box at the bottom of the form could facilitate the recording process of complaints. Carrying out the necessary action by METI to eliminate the complaint can enhance the level of learners' and other beneficiaries' satisfaction (ISO10002, 2014).
- *Course evaluation by learners* – On completion of the course, the course evaluation forms are distributed to learners. Based on the marks/comments provided via the course evaluation form, course overall marks and learners' satisfaction percentage can be calculated (ISO10002, 2014).

5.1.1.2. Analysis and evaluation

The METI should analyze and evaluate appropriate data and information arising from monitoring and measurement. The result of analysis should be used to evaluate:

- *Conformity of products and services* – Learners' attendance should be evaluated at the end of the course by calculating the attendance records and only if the results are acceptable, learners should be entitled to enroll the final exam.
- *Degree of beneficiary satisfaction* – Based on the marks of course evaluation given by learners, degree of satisfaction percentage can be calculated as maintaining documented information.

- *Performance of learners* – At the end of course completion, performance of learners has to be calculated based on their attendance, class room activity, as well as by factoring in assessment and final exam. The following tables are some examples of learner's performance and grading (ISO21001, 2018).

Table 5-1: Learner's performance and grading

Marks %	Grade	Description
85 ~ 100%	A	Excellent
75 ~ 84%	B	Very Good
65 ~ 74%	C	Good
50 ~ 64%	D	Pass
Below 50%	E	Fail

Table 5-2: Learner's overall evaluation

No.	Subject	Marks	Grade
1	CLASSROOM ACTIVITIES (5 marks)	/ 5	
2	CLASSROOM ATTENDANCE (5 marks)	/ 5	
3	ASSESSMENTS (40 marks)	/40	
4	FINAL EXAMINATION (50 marks)	/50	
Total Marks			

5.1.1.3. Methods of monitoring, measurement, analysis and evaluation

The common methods are as follows:

- Attendance monitoring – Learners have to attend to meet the attendance percentage of the METI to enter the final examination.
- Classroom activity – The educator should decide classroom activity marks to learners in every lecture time. This activity marks should also count in the final evaluation.
- Assessment – Assessment tests are exercises before the final examination. Assessment marks must also count in the final evaluation.
- Final examination – Learners who pass the final exam can get the course completion certificates.

The above monitoring and measurement are retained as documented information in records (UNESCO, 2011).

5.1.2. Internal Audit

The METI has to establish the Internal Audit program to monitor its EOMS at planned intervals for verification of the following issues:

- Compliance with the requirements of its EOMS
- Compliance with the requirements of ISO international standard
- Effectiveness of the implementation and maintenance of its EOMS.

Based on the ISO 21001:2018 Educational Organizations Management System, the internal audit program should contain the following procedure.

1. *Areas to be audited* – An internal audit should investigate all areas and activities of EOMS taking into account the importance of each site or activity and the

number of problems being encountered. The internal audit should cover all quality system procedures, work instructions and other documents related with quality system. Maintenance and control of those documents must be monitored (ISO9001, 2015).

2. *Schedule* – Internal audits should be held before the external audit. The EOMS status and importance of the existing processes and the results of the previous audits should be taken into account for planning. Audits are performed in accordance to prepared schedule (ISO9001, 2015).
3. *Frequency of Internal Audit* – The audit frequency should be at least once a year or in every six months and planning must be made according to the associated functions, activities and other requirements. The Audit schedule should be planned by selecting the areas to be covered, and drawing up the relevant timetable by taking into consideration all aspects of the quality related activities. The Audit frequency is normally based on the Plan and Time schedule within the time frame of one year to suit the work load. Frequency of audit should change if the system weakness or failure is detected, on the other hand, if there is any learners' or other beneficiaries' complaints found out, the frequency of internal audit should increase (ISO9001, 2015).
4. *Audit Checklist* – The audit checklist should be prepared with sufficient depth to reach the root of the problems and yet flexible enough to follow Audit trails. The checklist is to serve as a guide and to browse through the section during the audit. It is to be used as a memo for the items and areas to be covered. It shall be prepared to give enough flexibility to cover the most during the limited audit time. The checklist should contain pertinent questions to enable a detailed investigation into the department's procedures and controls. It must be able to verify and identify the effectiveness of the policy and the operational procedures and manuals. The scope of audit checklist should cover all major issues for observation and also include notes from the last audit results (ISO9001, 2015).

5. *Responsibilities* – The audit team leader should establish an audit plan and discuss with team members. He/she should take the leading role in the whole process of audit and has to carry out opening meeting together with team members and auditees. He/she has to organize and direct the team to achieve the successful audit while conducting the audit and carry out the closing meeting to draw out the conclusion of audit after discussing with members and auditee. After that he/she has to prepare and complete the Audit Report. Team members should prepare individual assignments while conducting audit, gather data and information and contribute to audit report (ISO9001, 2015).
6. *Audit Planning* – There are three stages in internal audit, namely the opening meeting, conducting audit and closing audit. In the opening meeting stage, the team leader needs to explain the purpose and method of audit. An indicative example is “the purpose of audit is to identify the risk, weakness and effectiveness of EOMS and procedures by collecting data with random sampling method”. In the conducting audit stage, interview to those concerned at area audited and review the documents and records required. In the closing meeting stage, the audit team needs to state the audit findings with evidence and need to draw the conclusions. If any nonconformity and/or observation exist, discuss the mandatory date to rectify and establish the audit meeting report with finding records (ISO9001, 2015).
7. *Audit Report* – Audit checklists, audit finding report and audit finding records have to be prepared and completed by audit team with signatures of auditors and auditees.

5.1.3. Management Review

The “top management” needs to review the EOMS and update the strategic plan, at planned intervals of “at least once per year”; suitability, adequacy and effectiveness must

be ensured (ISO21001, 2018). The Management Review meeting (MR meeting) must be conducted after each Internal Audit. The Principal or EOMS representative should determine the actual date for the MR meeting by coordinating with participating personnel. If there are some major changes or special conditions and events, the Principal or EOMS representative can arrange/request to gather for an unscheduled extraordinary MR meeting (ISO10002, 2014).

The Principal is responsible for conducting and chairing the MR meeting. He/she can evaluate and consider the best possible solution on the problem encountered and to give his/her decision to consensus or his/her own discretion.

The EOMS representative should comply quality policy with all relevant data and documentation, then schedule for the MR meeting and should propose to the Principal for approval. The results and output from the MR meeting should be documented and recorded in the meeting minutes, which is then submitted to the Principal for approval and distribution. He/she should notify all head of departments at least one week prior to the MR meeting scheduled date together with the MR meeting agenda. All head of departments must attend the MR meeting to represent his/her department and they need to review previous MR meeting and prepare required documents and data for discussion (ISO9001, 2015).

5.1.3.1. Management review inputs

“Status of action items” from previous MR meeting should be discussed and recorded in relation to all completed items. Items which are not completed has to be carried on as continuing actions and are recorded in the meeting minutes.

The External Auditor's report has to be reviewed and prepared necessary actions for follow-up as required. Nonconformity and observation if any raised in the reports need to be discussed for appropriate actions required in the MR meetings and status of action

to clear those (ISO, 2007). The following trends need to cover in MR meeting inputs:

1. *Learner and other beneficiary satisfaction* – performance of the METI is continuously monitored for efficiency and effectiveness to meet their satisfaction. Feedback received from them should be reviewed. Course evaluation by learners should review statically and discuss in MR meeting to identify and improve the status of learner and other beneficiary satisfaction.
2. *Quality objectives* – discuss the set up targets, performance, changes, amendment, level of achievement and required action.
3. *Process performance and conformity of products and services* – discuss the methods and actions to be taken if needed based upon the attendance and assessment marks of learners to improve the performance and conformity of learners.
4. *Nonconformities and corrective actions* – discuss about potential or actual nonconformity of EOMS and adopt the methods or actions to eliminate not to be reoccurrence.
5. *Monitoring and measurement outcomes* – marks of classroom attendance, activity, assessment and exam results are used as monitoring and measurement outcomes.
6. *Audit outcomes* – discuss about previous audit results and observations if any.
7. *Adequacy of resources* – discuss adequacy of resources for future plan and upgrading employees' qualification and skillfulness.
8. *Risks and opportunities* – identify risks and control measures to eliminate has to be adopted.
9. *Continual improvement* – review previous continual improvement process and adopt new process for future continual improvement (ISO21001, 2018).

5.1.3.2. Management review outputs

The output of the management review should include decisions and actions related to opportunities for improvement, any need for changes to EOMS and resources need, etc. Management review output is documented in the MR meeting. Action items are highlighted or placed under a special heading to ensure that they are easily identifiable and should include assignment of responsibility, time frame, and allocation of resources for implementation of the action. The MR meeting minutes and other documents associated with the review are confidential (ISO9001, 2015).

5.2. Summary

This chapter explained about the performance evaluation in this checking stage which was included monitoring, measurement, analysis and evaluation; internal audit; and management review sections. Further study on monitoring, measurement, analysis and evaluation, the METI should consider the satisfaction of learners, staffs and other beneficiaries by analyzing and evaluating with proper methods. According to ISO 21001:2018, there were seven processes to carry out for the internal audit process, on the other hand, the inputs and outputs of the management review process were also needed to consider to get a better performance. This checking stage is also important as one of the stages of a quality management system during operating the METI's EOMS.

CHAPTER 6 – IMPROVING STAGE

6.1. Improvement

The METI needs to determine and select the opportunities for implement and improvement of all necessary actions to meet the learners and other beneficiary needs. Then enhance the satisfaction of the learners, staffs, other beneficiaries, and any other related interested parties. To improve the performance and effectiveness of METI, it needs to address the future expectations and needs by preventing, correcting and reducing undesired effects (ISO21001, 2018).

6.1.1. Nonconformity and Corrective Action

Once nonconformity is identified and documented, further processing of the nonconformity report follows the procedure to corrective and preventive action. Upon receiving the report, the responsible Head of the Department investigates the cause of the problem noted as a nonconformity, proposes a corrective action to be taken, and indicates the date by which the corrective action will be fully implemented. The responsible person reviews the result to clear the nonconformity (ISO9001, 2015).

On or immediately after the due date for implementation of corrective action, the auditor follows up with an inquiry or an audit to determine if the corrective action has been implemented and if it is effective. When there is an objective evidence that the corrective action is effective, the nonconformity report is closed out. If more work is needed to fully implement the action, a new follow-up date is agreed upon (ISO21001, 2018).

Internal audits, implementation of resulting corrective actions, and follow-up audits are documented using the audit nonconformity report form. A description of the nonconforming condition, the proposal for a corrective action, and the follow-up audit and close-out of the report are required in this procedure. Pending nonconformity reports are kept by the auditor who initially issued the report. Storage location and retention period for close-out nonconformity reports are specified in the procedure for control of quality records. At the end of an auditing cycle, all nonconformity reports established during the cycle are compiled and analyzed and are presented at the management review meeting (ISO9001, 2015).

6.1.2. Continual Improvement

Improvement procedure applies to all activities in relation to the EOMS and concerns all departments of the METI. The METI needs to engage and implement the continual improvement philosophy throughout the entire organization. The quality system itself is designed to incorporate all elements necessary to identify opportunities for improvement and implement the improvement projects (ISO, 2015).

Everyone in the METI is encouraged to come up with ideas for improving products, processes, systems, services, and working environment. Improvement suggestions are evaluated and prioritized by the responsible person. Attendance, activity, assessment and pretest process monitor the improvement of learners. Provide theoretical and practical knowledge to meet their needs and expectations (ISO9001, 2015).

Improvements required for addressing daily feedback from operations and other activities are usually implemented through corrective and preventive actions. Operational procedure of corrective and preventive action defines the process. Long-term improvement process to fulfill the quality policy attain quality objectives or correct unfavorable trends are implemented through special management actions defined by the

management review. These actions should be documented in management review minutes or be issued as directives, memoranda, policy statements, circulars, etc.

The continual improvement process should be established from one of the following considerations:

- Quality policy and quality objectives,
- Management review,
- Audit data (external and internal audit reports),
- Quality records,
- Data of process characteristics and their trends,
- Records of nonconformities,
- Feedback information and data from the organization and interested parties,
- Feedback from the employee (ISO9001, 2015).

6.1.3. Opportunities for Improvement

In addition to the above-listed systems for monitoring continual performance, special evaluation procedure should be initiated to identify opportunities for improvement in other areas. Examples are:

- Workload/ capacity of employee and authorized organizational charts,
- Workload/ time and responsibilities of the management staff,
- Classroom performance and learner assessment records,
- Proper time allocation for the METI operational processes,
- Excessive waste of time in staff daily work done,
- Waste of labor and materials on document processing,
- Excessive cost of non-quality, and
- Excessive handling and storage of documents (ISO9001, 2015).

Opportunities for improvement of operations and systems are identified on two levels:

- Continuously, by top management, based on daily feedback from operations and other activities;
- Periodically, by the management review, based on analysis of long-term data and trends.

Those opportunities for improvement based on daily feedback from operations are evaluated by EOMS representative, when appropriate, are implemented through the system of corrective and preventive action. Typically, they would be triggered by such events as identification of a nonconforming process or product, complaint, internal audit finding, and other such specific events (ISO21001, 2018).

Opportunities for improvement based on longer-term data and trends are evaluated by the management review. They are prioritized with respect to their relevance for reaching the quality policy and quality objectives. When new important opportunities for improvement are not adequately supported by the current policy and objectives, the management review should change the policy and/or establish new quality objectives (ISO9001, 2015).

6.2. Summary

This chapter explained about the improvement of the EOMS in this improving stage which was included nonconformity and corrective action; continual improvement; and opportunities for improvement sections. This improving stage is also important as one of the stages of a quality management system during operating the METI's EOMS.

CHAPTER 7 – CONCLUSION AND RECOMMENDATIONS

Answering to the three research questions the study and analyses indicated that:

1. The key benefits of using ISO 21001:2018 in METI based on quality management principles are considered relevant, important and changeable
2. The transition of ISO 9001:2015 version to ISO 21001:2018 version in METI are considered important and effective for the organization
3. There are many suggestions to implement ISO 21001:2018 in METI effectively aligned with Regulation I/8: Quality Standards, STCW Convention, 1978, as amended.

All maritime education and training institutions must keep in focus to shift from current ISO 9001:2015 to the new ISO 21001:2018. The 9001 quality management system was described in more general to support manufacturing products and providing services, however, the new 21001 management system for educational organizations was described in more specific focus on providing educational related services for learners' and other beneficiaries' needs and requirements. That means it can support to get a good relationship between the educational organizations and the customers (learners and other beneficiaries).

In this study, the planning stage examined in more detail by describing the common matters for context of the organization, leadership and planning. The METI should consider the strategic direction related with its mission and vision, as well as, the scope

of the METI. The external and internal issues were also very important for the METI's operation which could be considered based on SWOT analysis, PESTLE analysis and "what-if" questionnaire. There were eight main aspects to continually maintain and improve the EOMS.

The leadership and commitment issues which are related with organizational roles, responsibilities and authorities should also be identified in accordance with the METI's EOMS policy. The actions to address risks and opportunities; how to plan to achieve the METI's objectives; and the planning of changes were examined in detail for the situation of the EOMS needs some changes to improve efficiently and effectively. The planning stage was very important as a foundation of a quality management system before establishing the METI's EOMS.

There were two main sections in the operating stage in this study namely: support and operation. The METI should consider the resources needed including human resources (HR), facilities, environment for operation of the educational processes, monitoring and measuring resources, and organizational knowledge. The competence, awareness and communication issues were also very important for the METI's operation.

The documented information process was also an important issue to continually maintain and improve the EOMS. The operation issues were described however those issues were varied according to the METI's nature so that those were not explained in detail in this study. This operating stage was also very important as a main driving body of a quality management system after establishing the METI's EOMS.

The performance evaluation in the checking stage which was included monitoring, measurement, analysis and evaluation; internal audit; and management review sections. The METI should consider the satisfaction of learners, staffs and other beneficiaries by analyzing and evaluating with proper methods. There were seven processes to carry out

for the internal audit process, on the other hand, the inputs and outputs of the management review process were also needed to consider to get a better performance. The checking stage was also important as one of the stages of a quality management system during operating the METI's EOMS.

The improvement of the EOMS in the improving stage which was included nonconformity and corrective action; continual improvement; and opportunities for improvement sections. A further recommendation would be for the maritime education and training sector, based on Plan-Do-Check-Act (PDCA) cycle, all those four stages mentioned in this study can effectively provide the educational organization management system in the future for the benefits of maritime education and training institutions.

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Appendix 1 – STCW Convention, 1978, as amended, Regulation I/8: Quality Standards

Source: STCW (2017 Edition)

1. Each Party shall ensure that:
 - (1) In accordance with the provisions of section A-I/8 of the STCW Code, all training, assessment of competence, certification, including medical certification, endorsement and revalidation activities carried out by non-governmental agencies or entities under its authority are continuously monitored through a quality standards system to ensure achievement of defined objectives, including those concerning the qualifications and experience of instructors and assessors; and
 - (2) Where governmental agencies or entities perform such activities, there shall be a quality standards system.
2. Each Party shall also ensure that an evaluation is periodically undertaken, in accordance with the provisions of section A-I/8 of the STCW Code, by qualified persons who are not themselves involved in the activities concerned. This evaluation shall include all changes to national regulations and procedures in compliance with the amendments to the Convention and STCW Code, with dates of entry into force later than the date information was communicated to the Secretary-General.
3. A report containing the results of the evaluation required by paragraph 2 shall be communicated to the Secretary-General in accordance with the format specified in section A-I/7 of the STCW Code.

Section A-I/8

Mandatory regarding quality standards

National objectives and quality standards

1. Each Party shall ensure that the education and training objectives and related standards of competence to be achieved are clearly defined and that the levels of knowledge, understanding, and skills appropriate to the examinations and assessments required under the Convention are identified. The objectives and related quality standards may be specified separately for different courses and training programs and shall cover the administration of the certification system.
2. The field of application of the quality standards shall cover the administration of the certification system, all training courses and programs, examinations and assessments carried out by or under the authority of a Party and the qualifications and experience required of instructors and assessors, having regard to the policies, systems, controls and internal quality assurance reviews established to ensure achievement of the defined objectives.
3. Each Party shall ensure that an independent evaluation of the knowledge, understanding, skills and competence acquisition and assessment activities, and of the administration of the certification system, is conducted at intervals of not more than five years in order to verify that:
 - (1) All applicable provisions of the Convention and STCW Code, including their amendments, are covered by the quality standards system;
 - (2) All internal management control and monitoring measures and follow-up actions comply with planned arrangements and documented procedures and are effective in ensuring achievement of the defined objectives;
 - (3) The results of each independent evaluation are documented and brought to the attention of those responsible for the area evaluated; and
 - (4) Timely action is taken to correct deficiencies.

Section B-I/8

Guidance regarding quality standards

1. In applying quality standards under the provisions of regulation I/8 and section A-I/8 to the administration of its certification system, each Party should take account of existing national or international models, and incorporate the following key elements:
 - (1) An expressed policy regarding quality and the means by which such policy is to be implemented;
 - (2) A quality system incorporating the organizational structure, responsibilities, procedures, processes, and resources necessary for quality management;
 - (3) The operational techniques and activities to ensure quality control;
 - (4) Systematic monitoring arrangements, including internal quality-assurance evaluations, to ensure that all defined objectives are being achieved; and
 - (5) Arrangements for periodic external quality evaluations as described in the following paragraphs.
2. In establishing such quality standards for the administration of their national certification system, Administrations should seek to ensure that the arrangements adopted:
 - (1) Are sufficiently flexible to enable the certification system to take account of the varying needs of the industry, and that they facilitate and encourage the application of new technology;
 - (2) Cover all the administrative matters that give effect to the various provisions of the Convention, in particular regulations I/2 to I/15 and other provisions which enable the Administration to grant certificates of service and dispensations and to withdraw, cancel and suspend certificates;
 - (3) Encompass the Administration's responsibilities for approving training and assessment at all levels, from undergraduate-type courses and updating courses for certificates of competency to short courses of vocational training; and

- (4) Incorporate arrangements for the internal quality-assurance reviews under paragraph 1.4 involving a comprehensive self-study of the administrative procedures, at all levels, in order to measure achievement of defined objectives and to provide the basis for the independent external evaluation required under section A-I/8, paragraph 3.

Quality standards model for assessment of knowledge, understanding, skills, and competence

- 3. The quality standards model for assessment of knowledge, understanding, skills, and competence should incorporate the recommendations of this section within the general framework of either:
 - (1) A national scheme for education and training accreditation or quality standards; or
 - (2) An alternative quality-standards model acceptable to the Organization.
- 4. The above quality-standards model should incorporate:
 - (1) A quality policy, including a commitment by the training institution or unit to the achievement of its stated aims and objectives and to the consequential recognition by the relevant accrediting or quality-standards authority;
 - (2) Those quality-management functions that determine and implement the quality policy, relating to aspects of the work which impinge on the quality of what is provided, including provisions for determining progression within a course or program;
 - (3) Quality system coverage, where appropriate, of the academic and administrative organizational structure, responsibilities, procedures, processes and the resources of staff and equipment;
 - (4) The quality-control functions to be applied at all levels to the teaching, training, examination and assessment activities, and to their organization and

implementation, in order to ensure their fitness for their purpose and the achievement of their defined objectives;

- (5) The internal quality-assurance processes and reviews which monitor the extent to which the institution, or training unit, is achieving the objectives of the programs it delivers, and is effectively monitoring the quality-control procedures which it employs; and
 - (6) The arrangements made for periodic external quality evaluations required under regulation I/8, paragraph 2, and described in the following paragraphs, for which the outcome of the quality-assurance reviews forms the basis and starting point.
5. In establishing quality standards for education, training and assessment programs, the organizations responsible for implementing these programs should take account of the following:
- (1) Where provisions exist for established national accreditation, or education quality standards, such provisions should be utilized for courses incorporating the knowledge and understanding requirements of the Convention. The quality standards should be applied to both management and operational levels of the activity and should take account of how it is managed, organized, undertaken and evaluated, in order to ensure that the identified goals are achieved.
 - (2) Where the acquisition of a particular skill or accomplishment of a designated task is the primary objective, the quality standards should take account of whether real or simulated equipment is utilized for this purpose, and of the appropriateness of the qualifications and experience of the assessors, in order to ensure achievement of the set standards.
 - (3) The internal quality-assurance evaluations should involve a comprehensive self-study of the program, at all levels, to monitor achievement of defined objectives through the application of quality standards. These quality-assurance reviews should address the planning, design, presentation, and evaluation of programs as

well as the teaching, learning and communication activities. The outcome provides the basis for the independent evaluation required under section A-I/8, paragraph 3.

The independent evaluation

6. Each independent evaluation should include a systematic and independent examination of all quality activities, but should not evaluate the validity of the defined objectives. The evaluation team should:
 - (1) Carry out the evaluation in accordance with documented procedures;
 - (2) Ensure that the results of each evaluation are documented and brought to the attention of those responsible for the area evaluated; and
 - (3) Check that timely action is taken to correct any deficiencies.
7. The purpose of the evaluation is to provide an independent assessment of the effectiveness of the quality-standard arrangements at all levels. In the case of an education or training establishment, a recognized academic accreditation or quality-standards body or Government agency should be used. The evaluation team should be provided with sufficient advance information to give an overview of the tasks at hand. In the case of a major training institution or program, the following items are indicative of the information to be provided:
 - (1) The mission statement of the institution;
 - (2) Details of academic and training strategies in use;
 - (3) An organization chart and information on the composition of committees and advisory bodies;
 - (4) Staff and student information;
 - (5) A description of training facilities and equipment; and
 - (6) An outline of the policies and procedures on:
 - 6.1. student admission;
 - 6.2. the development of a new course and review of existing courses;

- 6.3. the examination system, including appeals and resits;
- 6.4. staff recruitment, training, development, appraisal, and promotion;
- 6.5. feedback from students and from industry; and
- 6.6. staff involved in research and development.

The report

- 8. Before submitting a final report, the evaluation team should forward an interim report to the management, seeking their comments on their findings. Upon receiving their comments, the evaluators should submit their final report, which should:
 - (1) Include brief background information about the institution or training program;
 - (2) Be full, fair and accurate;
 - (3) Highlight the strengths and weaknesses of the institution;
 - (4) Describe the evaluation procedure followed;
 - (5) Cover the various elements identified in paragraph 4;
 - (6) Indicate the extent of compliance or non-compliance with the requirements of the Convention and the effectiveness of the quality standards in ensuring achievement of defined aims and objectives; and
 - (7) Spell out clearly the areas found to be deficient, offer suggestions for improvement and provide any other comments the evaluators consider relevant.

Appendix 2 – Consent Letter to Participants

Dear Participant,

Thank you for taking the time to answer the attached questionnaire. I will be very grateful if you will take a few minutes to complete it.

The purpose of the questionnaire is to collect data for a Master of Science Dissertation at the World Maritime University (WMU) about how the Quality Management System is implementing in your organization. The World Maritime University (WMU) is the higher educational institution of the International Maritime Organization (IMO) under the United Nations (UN).

Data derived from this questionnaire is only for the purpose of the dissertation and I hereby assure complete confidentiality. Your name (if given) will be anonymized in the final report. Further, those anonymized data will be stored until 16 October 2018 after that the electronic files will be deleted and hard copies will be shredded.

I consider you an important part of this survey. Your participation – through purely voluntary – is critical to the success of the survey and is very much appreciated.

If you have any questions, you are welcome to send your questions to **Htet Khaing Kyi Lin (Tony)** for a prompt reply:

Email: w1701255@wmu.se

Thank you very much for your cooperation and participation in this survey.

Appendix 3 – Research Questionnaire

Please answer by clicking the check boxes or writing in the spaces for your answers.

Thank you.

1. Name of participant

2. Nationality of participant

3. Name of organization

4. Type of organization

Mark only one oval.

- ☐ Maritime Administration
- ☐ Maritime Education and Training Institution
- ☐ Shipping Company or Seafarer Recruitment Company
- ☐ Other:

5. What is your responsibility in your organization? (please specify department or section if any)

6. How long have you been working in your organization?

Mark only one oval.

- ☐ Less than 5 years
- ☐ More than 5 years but less than 10 years
- ☐ More than 10 years

7. **Does your organization use ISO 9001:2015 Quality Management System? If yes, please specify from which classification society?**
8. **When did your organization change ISO 9001:2008 to ISO 9001:2015 version?**
Mark only one oval.
- ☐ 2 years ago
 - ☐ Last year
 - ☐ Recently (within this year)
 - ☐ Not yet (In progress)
9. **What are the aims and objectives of your organization?**
10. **What is the quality policy of your organization?**
11. **Are employees (Instructors and staffs) aware of the quality policy and objectives?**
Mark only one oval.
- ☐ Yes, everyone
 - ☐ No, only quality management representative
 - ☐ Not everyone, only top management
12. **Describe one or two of each external and internal issues which are currently facing in your organization.**
13. **Define the stakeholders and explain who are the interested parties of your organization?**
14. **How do you promote continual improvement for your organization?**

15. Does your organization revise subsequently its organizational chart, responsibilities and authorities of employees? If yes, who will decide to allocate and reallocate? (E.g. by top management or by management review meeting)
16. According to PDCA cycle (Plan, Do, Check and Act), how do you manage "Planning of changes" in quality management system?
17. How do you measure customer satisfaction?
18. How do you monitor and measure the resources to improve? (E.g. employees, infrastructure, working environment and organizational knowledge)
19. How do you determine the competence of the new employees (instructors and staffs) to employ in your organization?
20. What kind of training is given to new employees (Instructors and staffs) in your organization and how long does the probation period take?
21. How are the documents and records of your organization maintained? (please explain for both soft copies and hard copies)
22. How do you dispose the old documented information and records of your organization? *Mark only one oval.*
- ☐ immediately deleted
 - ☐ hold some periods and deleted
 - ☐ deleted annually
 - ☐ never delete within 5 years

23. **How do you manage the communication issue between employees and customers?**
24. **How do you evaluate the performance of employees (instructors and staffs) in your organization?**
25. **What is your appropriate action to your organization based on customer or trainee feedback and complaints?**
26. **Has the number of customer or trainee complaints changed over time?**
Mark only one oval.
- ☐ Increase
 - ☐ Decrease
 - ☐ Remain the same
 - ☐ No customer complaints
27. **How many time do you perform internal audit in your organization?**
Mark only one oval.
- ☐ Once a year
 - ☐ Two times per a year
 - ☐ Three times per a year
28. **How many time do you perform management review meeting in your organization?** *Mark only one oval.*
- ☐ Once a year
 - ☐ Two times per a year
 - ☐ Every month
 - ☐ After internal audit and other external audits

29. Explain the procedure of nonconformity and corrective action for your organization.

30. Does your organization use the STCW and IMO model courses? If yes, please specify which IMO model courses are using?

I appreciate your completion of this questionnaire. Thank you so much.

Researcher Name: Htet Khaing Kyi Lin

Nationality: Myanmar

Contact Email: w1701255@wmu.se

Studying Degree: Master of Science in Maritime Affairs

Specialization: Maritime Education and Training

Expected Year of Graduation: November 2018

Research Title: The Maritime Education and Training Sector: Beyond Traditional Quality Management

Supervisor Name: Associate Professor Dimitrios Dalaklis

Nationality: Greece

Contact Email: dd@wmu.se

Appendix 4 – Presentation of Data

Findings

1. Name of participant

Confidential Data

2. Nationality of participant

Confidential Data

3. Name of organization

Confidential Data

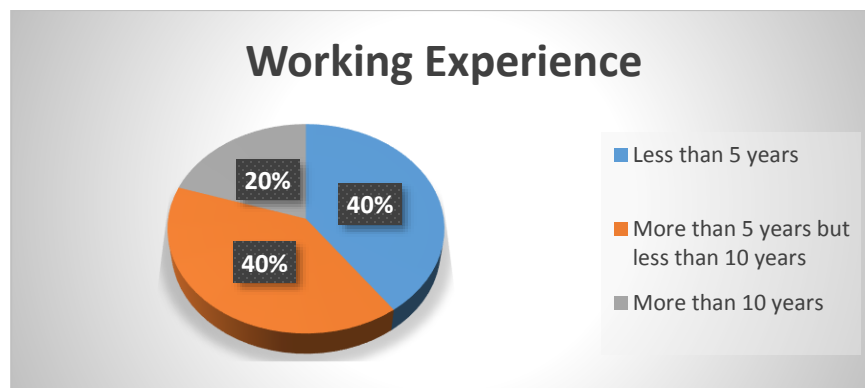
4. Type of organization

Maritime Education and Training Institutions

5. What is your responsibility in your organization? (please specify department or section if any)

Confidential Data

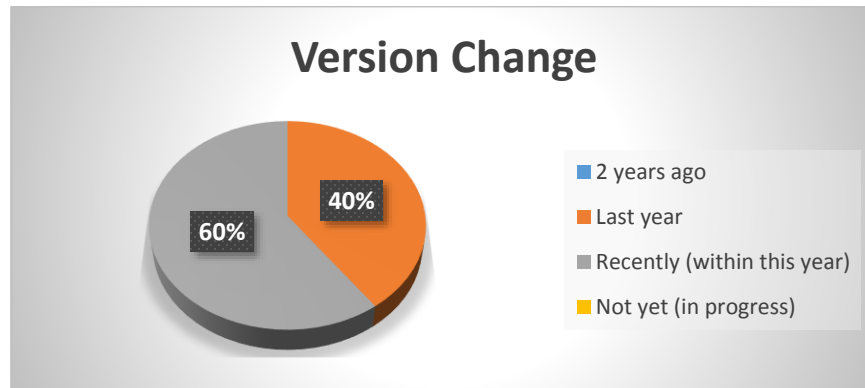
6. How long have you been working in your organization?



7. Does your organization use ISO 9001:2015 Quality Management System? If yes, please specify from which classification society?

All participants' organizations are using ISO 9001:2015.

8. When did your organization change ISO 9001:2008 to ISO 9001:2015 version?



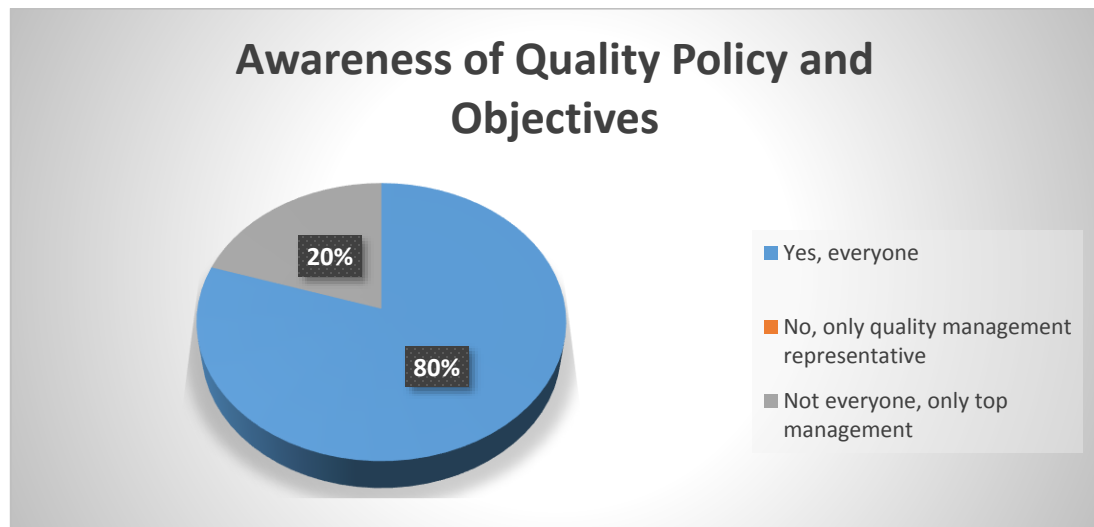
9. What are the aims and objectives of your organization?

- To contribute towards modernization and development of the State by maritime industry.
- To nurture the ethical, skillful and reputable maritime experts.
- To teach science and technology contributory to the maritime profession.
- To make plans and arrangements for perpetual development of maritime industry.
- To know and comply with the provisions and standards prescribed by IMO.
- To carry out the necessary research works for the development of the maritime industry.
- To aim zero customer complaint.
- To achieve 80% pass rate of every courses.
- Students at the heart of what we do.

10. What is the quality policy of your organization?

- To raise the quality of education and maintain the University as an effective human resource development institution under the provision of maritime education that meet prevailing international standards.
- To provide quality maritime education and training through modern and updated equipment.
- To obtain the high satisfaction levels of the customers by the continual improved service of organization's quality management and employees.
- To train highest quality marine officers and ratings to meet the expectation interested parties.

11. Are employees (Instructors and staffs) aware of the quality policy and objectives?



12. Describe one or two of each external and internal issues which are currently facing in your organization.

- Global Crisis, less demand of Marine Officers, Government and None of Ship owners support to Maritime Training Facilities
- External: economic, political, legal, social, and global conditions
Internal: - Teaching and Learning Approach process; Standards, guidelines, and models adopted by the organization
- High Quality Products expected by End Users (Ship owners) Impact on business by the competitors.
- Internal & External issue Internal issue - (a) Skilled and experienced human resource (b) Availability of resource External issue - Local & International regulatory requirement
- Student satisfaction results, student intake numbers

13. Define the stakeholders and explain who are the interested parties of your organization?

- Learners, lecturers, authorities, ship owners, crew manning companies, seafarers, seafarers' families, competitors, trainees, employees, regulator, end users, shipping companies, training providers, students

14. How do you promote continual improvement for your organization?

- Follow our Moto "Your Value is Our Brilliance".
- Effective use of the quality policy, mission statement and quality objectives by audit results, analysis of data, corrective and preventive actions and management review
- By PDCA and Risk based thinking

- Implementing QMS to achieve Quality Objective and Policy to get effectiveness of product (trainees) performance and customers' satisfaction as continual improvement.
- Through quality monitoring and improvement mechanisms (programme quality meetings, observations, quality improvement plan).

15. Does your organization revise subsequently its organizational chart, responsibilities and authorities of employees? If yes, who will decide to allocate and reallocate? (E.g. by top management or by management review meeting)

- Top management
- MR meeting

16. According to PDCA cycle (Plan, Do, Check and Act), how do you manage "Planning of changes" in quality management system?

- Catch the wave of drastically technology changes, updated IMO Model courses
- The Quality Management System is designed to meet the stakeholder needs in order to gain confidence in the ability of the University to provide the desired quality service, which meets the needs and expectations, as well as consistently maintaining such quality. Top management discuss about changes for academic matters at academic board meeting and do action according to the meeting minutes.
- Through Quality Meetings, Audits, NC reports, Feedbacks, Management Reviews.

- Identify purpose of changes, review original requirement and assess to fulfill new requirement based on our capability and cost impact. If decide to change, procedure determine and distribute to all sectors concerned to proceed.
- Strategic planning by top management.

17. How do you measure customer satisfaction?

- by Pass Rate & feedback
- To satisfy customer and end-user needs and expectations, the management of University will regularly review to understand the needs and expectations of its customers, including those of potential customers, determine key product characteristics for its customers and end-users, identify and assess competition in its market, and identify market opportunities, weaknesses and future competitive advantage. University will ensure that the educational services are in conformity with syllabuses by reviewing regularly.
- By feedbacks and evaluations
- Based on the marks of course evaluation given by trainees, degree of satisfaction % is calculated.
- Surveys among students, staff, employer engagement forum, meetings with individual companies

18. How do you monitor and measure the resources to improve? (E.g. employees, infrastructure, working environment and organizational knowledge)

- Advanced schedule, organizational knowledge, benchmarking of larger organization, best practice
- Head of Departments carry out regular analyzing of examination results, student performances, teaching methods. To be effectiveness of courses, all

head of departments review and monitor for respective courses at least once a year. Also, course leader and head of department review examination questions at least once a year.

- By training and education internally and externally to employees; by monitoring the maintenance plan and feedbacks to infrastructure; by monitoring the safe and happy working environment through quality meetings; by training and education internally and externally to organizational knowledge.
- Employee - Staff evaluation by HOD - Instructor evaluation by trainees. Infrastructure and working Environment - Maintenance (Admin Dept.)
- Through both customer feedback and planning

19. How do you determine the competence of the new employees (instructors and staffs) to employ in your organization?

- by HR Criteria, and regular evaluation of his competence
- Management board has decided depends on condition.
- By set out the required competence scheme for each rank; By orientation report; By experience; By History of his/her performance; By interview
- Qualification of staffs and monitored competence by HOD. Instructor - Assigned work of lecture note preparation and reviewed by Principal.
- Interview, micro teach.

20. What kind of training is given to new employees (Instructors and staffs) in your organization and how long does the probation period take?

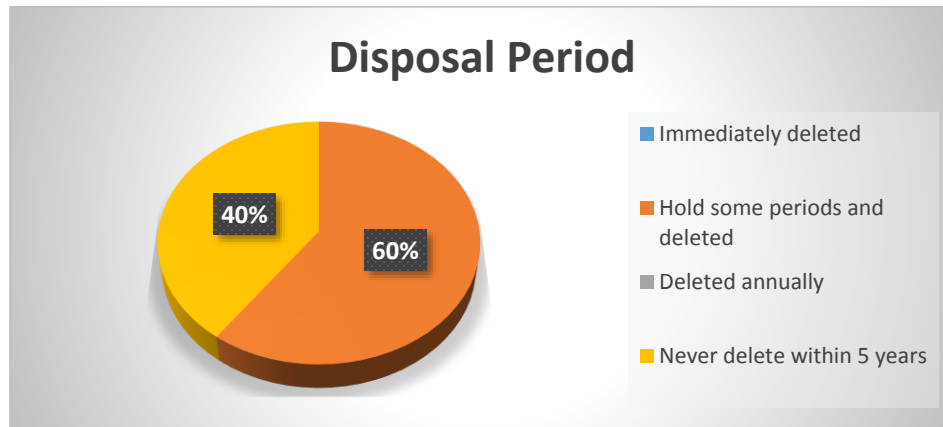
- Mandatory Training, On-Job-Training

- Familiarization of the Organization knowledge of Quality Management System. The probation period is not specified.
- 3 - months of probation period
- Probation 1 year, training depends on the position held and qualifications. Some courses are mandatory (risk assessment etc.) others depend on the needs of an individual (teacher training)

21. How are the documents and records of your organization maintained? (please explain for both soft copies and hard copies)

- All are in accordance with standard, Industry, and sufficient to change Learning objectives to learning outcomes, with back up, retrieval, storage, disposal, change request forms
- Both soft copies and hard copies
- Filing batch by batch / course by course for hard copies as per retention period; Scan each doc/ records into hard drives (set procedure for controlling soft doc and records)
- Heads of department are responsible to control to ensure (a) availability & suitability for use (b) adequately protect from access of unauthorized person and safe from environmental and biological hazards.
- mainly electronically, only exam packs are required to be kept in paper

22. How do you dispose the old documented information and records of your organization?



23. How do you manage the communication issue between employees and customers?

- By Business Developing Department
- Depends on condition
- By training and education; By quality meetings; By feedbacks and evaluations; By NC reports
- Use mobile phone, notice board, internet website.
- Through regular meetings with customers and disseminate relevant information on weekly meetings if required.

24. How do you evaluate the performance of employees (instructors and staffs) in your organization?

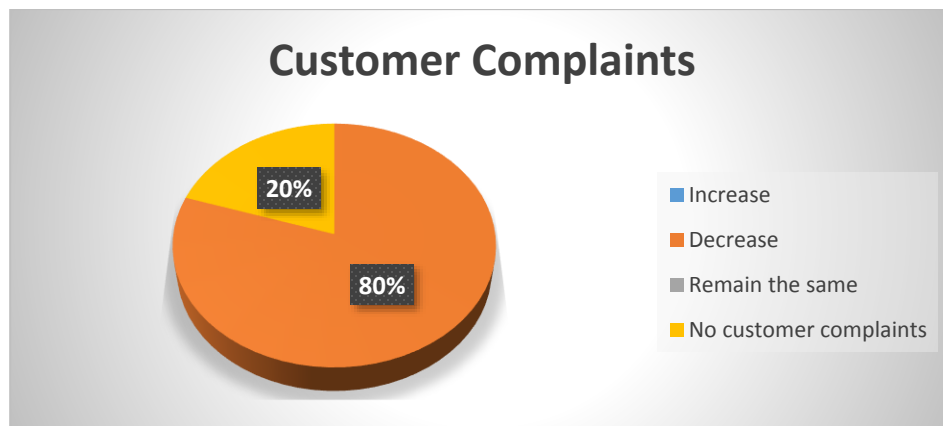
- Based on Learners Feedback
- By using key performance indicators
- Through Feedbacks by customers

- Evaluation to instructor by trainees- two weekly
Staff Evaluation to staff by HOD - annually
- Observations, student feedback

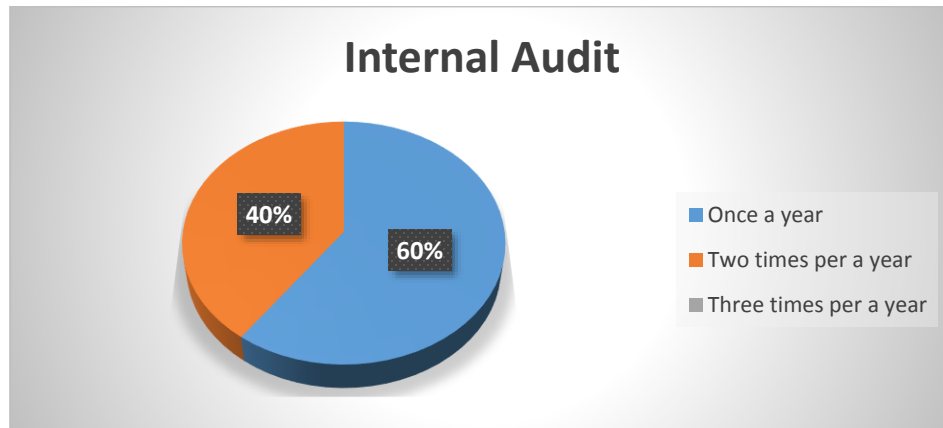
25. What is your appropriate action to your organization based on customer or trainee feedback and complaints?

- without in due delay, try to eliminate, mitigate, and share Risk Sources
- After collecting feedback and complaints, we have to do action plan.
- 1. Correction 2. Propose corrective action by respective department heads 3. Agree by Top Management and QMR 4. Perform the corrective action by a targeted date 5. Close case. 6. Review recurring or not in next internal audit
- Minor defects such as lighting, air-con, and class room facility, are rectified by General staff supervised by In-charge of staff. Major defects case shall be managed by Admin Department Head under the authority of Principal. If complaint is about instructor, Principal discuss with instructor to eliminate.
- Informal investigation and actions based on the outcome.

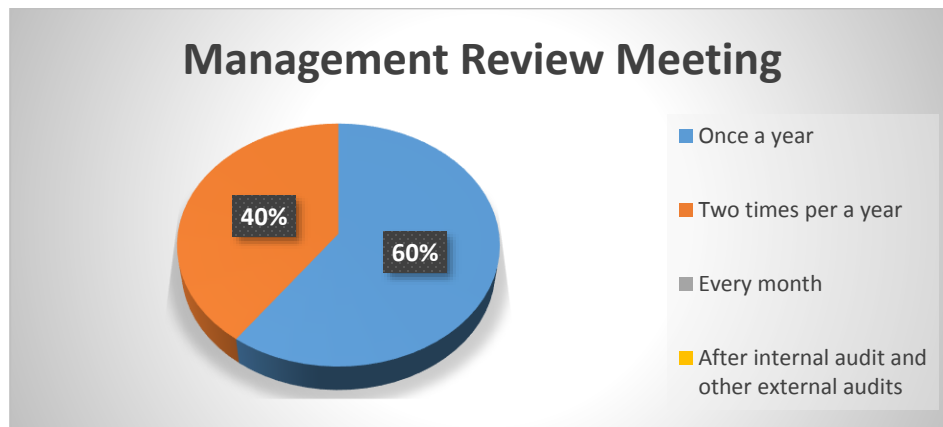
26. Has the number of customer or trainee complaints changed over time?



27. How many time do you perform internal audit in your organization?



28. How many time do you perform management review meeting in your organization?



29. Explain the procedure of nonconformity and corrective action for your organization.

- 5 WHY root Cause, Control immediate cause and correct root cause
- The auditor final report will summarize findings by: a) Confirming the sections audited comply with the quality management system; or b) Detailing which areas do not conform to the quality management system. When non-

conformances are identified that do not comply, the auditor shall issue a non-conformance report (NCR) and notify the persons concerned. Follow-up audits will take place to establish that corrective action has taken place within the agreed time scale.

- 1. Correction 2. Propose corrective action by respective department heads 3. Agree by Top Management and QMR 4. Perform the corrective action by a targeted date 5. Close case. 6. Review recurring or not in next internal audit
- Trainees of less than 90% attendance shall not meet the requirement of Pre-test exam, i.e. NC case. Issue monthly attendance % and warning issue for less than 90% attendance trainees as corrective action.
- Relevant actions are implemented through training and communication.

30. Does your organization use the STCW and IMO model courses? If yes, please specify which IMO model courses are using?

- STCW 1978 as amended, all over 25 courses are in accordance with IMO model courses
- IMO model course 7.02, 7.03, 7.04
- About 40 courses.
- No, national standards used