

UNIVERSITY OF PIRAEUS



DEPARTMENT OF MARITIME STUDIES

MSc IN SHIPPING MANAGEMENT

**QUALITY STANDARDS FOR ONLINE TRAINING
AND DISTANCE LEARNING OF SEAFARERS**

**Case Company: Angelicoussis Group (MDM, MTM,
MGM)**

TAGOUZI ALEXANDRA

Master - Thesis

Submitted to the Department of Maritime Studies
of the University of Piraeus to cover the
requirements for other completion of
the MSc in Shipping Management graduate program

Piraeus
October 2024

The person who carries out the thesis bears the entire responsibility of determining the fair use of the material, which is defined on the basis of the following factors of the purpose and character of the use (commercial, non-profit or educational), the nature of the material used (extract, part of text, drafts, figures, images or maps), the proportion and importance of the part it uses in relation to the whole copyrighted text and the possible consequences of such use on the market or the general value of the copyrighted text.

The present Master Thesis was unanimously approved by the Three-Member Examination Committee appointed by the General Assembly of the Department of Maritime Studies, University of Piraeus, in accordance with the Operating Regulations of the Postgraduate Program in Maritime Administration.

The Committee's members were as follows:

- Assistant Prof. Stefanos Chatzinikolaou (Supervisor)
- Associate Prof. Alexandros Artikis
- Assistant Prof. Dionysios Polemis

"The approval of the Thesis by the University of Piraeus Department of Maritime Studies does not imply acceptance of the author's opinions."

Contents

Executive summary.....	2
1. Introduction	4
2. Industry Overview	5
2.1 The demand side: Maritime training requirements.....	5
2.1.1 Principal of mandatory maritime training	5
2.1.2 Non mandatory maritime training and industry standards	8
2.2 The demand side: Seafarer as a learner	14
2.3 The supply side: Maritime training providers	16
3. The Group.....	22
3.1 Group characteristics and expectations	22
3.2 Group general training policy	24
3.3 DELPHIC MTC in numbers	25
3.4 Policy on online training and actual relevant processes.....	31
3.5 Advantages of in-house Training	33
4. Objectives - Goals of the study.....	34
4.1 Goals of the study	34
4.2 Methodology followed	34
4.3 Company Involvement	35
5. Review of distance learning and online training concepts.....	36
5.1 Distance learning and online training	36
5.2 Maritime distance learning	39
6. Quality standards and factors affecting the effectiveness of online training and distance learning.....	40
6.1 Description of training cycle and process of training needs identification	40
6.2 Online training specific.....	40
6.3 An overview of quality criteria and quality standards of e-learning.....	42
6.4 Factors affecting the effectiveness of online training and distance learning	44
7. Case Study	55
8. Recommendations & Conclusion	60
8.1 Recommendations	62
8.2 Conclusion	65
9. References.....	67
10. Appendices.....	77

Executive summary

Maritime education and training are of paramount importance for the maritime industry. Maritime education and training link directly to efficiently manning the vessels by preparing and cultivating personnel to operate and manage this enormous in size, expensive, complicated, and capital-intensive asset. The importance of seafarers training in the shipping labor market and the shipping industry in general is visible and apparent, as the Human Element is the one driving the whole industry.

Having taken the initiative to provide to Angelicoussis Group a comparative analysis of quality standards and evaluation criteria and a justified proposal regarding the criteria for evaluation of online and distance training in the maritime industry, the methodology selected contained desktop research of the existing literature, both academic and maritime context specific, whereas the scientific fields in focus were Quality Standards in distance learning and Maritime Education and Training.

The technological connectivity has transformed the way that people live and interact. Geography is no longer the primary constraint on organizations. E-HRM has entered the companies and nowadays basic HR functions have adopted the use of technologies in the day-to-day operations. Training and development and general learning are an HR function that has seen important effect and contribution of the technological connectivity. E-Learning courses include both content and instructional methods that help people learn the content. They can be synchronous, asynchronous, or blended and are delivered via digital devices using words in the form of spoken or printed text and multimedia such as illustrations, photos, animation, or video.

In today's maritime environment, seafarers use diverse and even complicated technology as part of their day-to-day work. In such a context, the use of new technologies has created a new educational framework and especially in the marine education we see new broad ways being opened to the learning and tutoring sectors. Maritime Education and Training can effectively make use of the modern technologies, namely the offered E-learning tools so as to promote knowledge management best practices for the seafarers.

Despite the importance placed on training for the Maritime industry and its personnel, explicit quality standards have not been set by the industry. Also, an evaluation system for the E-learning use in the maritime industry has not been established up to this point.

However, throughout the literature, many researchers and academics have touched the issue of quality for e-learning. The criteria identified concentrating on the technical features of the course deal with the tutoring tools used, the platform and its accessibility and flexibility, the design of the system, the technological features and the overall virtual experience and user-friendliness as well as the possibility of formal online assessments. Also, criteria like data security, amount of instructor-led interaction, and availability of online discussion groups belong to this category.

The criteria identified concentrating on a more high-level perspective deal with the commitment from the top management towards training and specifically online training, the commitment of the company to invest on the latest technological trends; the continuous identification of the training needs always involving all relevant stakeholders, the involvement of the seafarers themselves in the training process design. Moreover, it is of paramount importance as it adds great value to bring more work-related experiences into the learning situation in order to take advantage of the seafarers' experience as basis for examples, adding a problem-centered approach into the learning experience.

A shipping company applying e-learning for the training and development of the seafarers has to thoroughly examine some important factors affecting the effectiveness of online and distance learning. The common trends identified across the comparative analysis performed deal with the course structure and design, the evaluation and assessment of the e-learning course, the course instructor, the overall program duration, the number of students participating and the length of the course, the faculty and technology support, the strategic planning concerning the company's training policy, the learners' satisfaction, the student interaction and of course the student engagement and motivation.

KEYWORDS: training, seafarers, e-learning, criteria

ΠΕΡΙΛΗΨΗ

Η ναυτική εκπαίδευση και κατάρτιση είναι υψίστης σημασίας για τη ναυτιλιακή βιομηχανία. Συνδέονται άμεσα με την αποτελεσματική επάνδρωση των πλοίων, προετοιμάζοντας και καλλιεργώντας προσωπικό. Η σημασία της εκπαίδευσης των ναυτικών στη ναυτιλιακή αγορά εργασίας και γενικότερα στη ναυτιλιακή βιομηχανία είναι ορατή και εμφανής, καθώς το ανθρώπινο στοιχείο είναι αυτό που οδηγεί ολόκληρο τον κλάδο. Έχοντας αναλάβει την πρωτοβουλία να παράσχει στον Όμιλο Αγγελικούση μια συγκριτική ανάλυση των προτύπων ποιότητας και των κριτηρίων αξιολόγησης και μια αιτιολογημένη πρόταση σχετικά με τα κριτήρια αξιολόγησης της διαδικτυακής και εξ αποστάσεως εκπαίδευσης στη ναυτιλιακή βιομηχανία, η επιλεγμένη μεθοδολογία περιείχε επιτραπέζια έρευνα της υπάρχουσας βιβλιογραφίας, τόσο ακαδημαϊκής, και συγκεκριμένα για το θαλάσσιο πλαίσιο, ενώ τα επιστημονικά πεδία στο επίκεντρο ήταν τα Πρότυπα Ποιότητας στην εξ αποστάσεως εκπαίδευση και η Ναυτική Εκπαίδευση και Κατάρτιση.

Η τεχνολογική συνδεσιμότητα έχει μεταμορφώσει τον τρόπο με τον οποίο ζουν και αλληλεπιδρούν οι άνθρωποι. Η γεωγραφία δεν είναι πλέον ο πρωταρχικός περιορισμός για τους οργανισμούς. Το E-HRM έχει εισέλθει στις εταιρείες και σήμερα οι βασικές λειτουργίες HR έχουν υιοθετήσει τη χρήση τεχνολογιών στις καθημερινές λειτουργίες. Η εκπαίδευση και η ανάπτυξη και η γενική μάθηση είναι μια λειτουργία ανθρώπινου δυναμικού που έχει δει σημαντική επίδραση και συμβολή στην τεχνολογική συνδεσιμότητα. Τα μαθήματα e-learning περιλαμβάνουν τόσο περιεχόμενο όσο και εκπαιδευτικές μεθόδους που βοηθούν τους ανθρώπους να μάθουν το περιεχόμενο. Μπορούν να είναι σύγχρονα, ασύγχρονα ή συνδυασμένα και παραδίδονται μέσω ψηφιακών συσκευών χρησιμοποιώντας λέξεις με τη μορφή προφορικού ή έντυπου κειμένου και πολυμέσων, όπως εικονογραφήσεις, φωτογραφίες ή βίντεο. Οι ναυτικοί χρησιμοποιούν ποικίλη, ακόμη και περίπλοκη τεχνολογία ως μέρος της καθημερινής τους εργασίας. Σε ένα τέτοιο πλαίσιο, η χρήση των νέων τεχνολογιών έχει δημιουργήσει ένα νέο εκπαιδευτικό πλαίσιο και ειδικά στη ναυτική εκπαίδευση βλέπουμε να ανοίγονται νέοι ευρύτεροι δρόμοι στους τομείς της μάθησης και του φροντιστηρίου. Η Ναυτική Εκπαίδευση και Κατάρτιση μπορεί να αξιοποιήσει αποτελεσματικά τις σύγχρονες τεχνολογίες, δηλαδή τα προσφερόμενα εργαλεία ηλεκτρονικής μάθησης, ώστε να προωθήσει τις βέλτιστες πρακτικές διαχείρισης γνώσης για τους ναυτικούς.

Παρά τη σημασία που αποδίδεται στην εκπαίδευση για τη ναυτιλιακή βιομηχανία και το προσωπικό της, δεν έχουν τεθεί σαφή πρότυπα ποιότητας από τη βιομηχανία. Επίσης, μέχρι σήμερα δεν έχει δημιουργηθεί σύστημα αξιολόγησης για τη χρήση της ηλεκτρονικής μάθησης στη ναυτιλιακή βιομηχανία. Ωστόσο, σε όλη τη βιβλιογραφία, πολλοί ερευνητές και ακαδημαϊκοί έχουν αγγίξει το ζήτημα της ποιότητας για την ηλεκτρονική μάθηση. Τα κριτήρια που προσδιορίστηκαν εστιάζοντας στα τεχνικά χαρακτηριστικά του μαθήματος αφορούν τα εργαλεία διδασκαλίας που χρησιμοποιούνται, την πλατφόρμα και την προσβασιμότητα και ευελιξία της, τον σχεδιασμό του συστήματος, τα τεχνολογικά χαρακτηριστικά και τη συνολική εικονική εμπειρία και φιλικότητα προς τον χρήστη, καθώς και τη δυνατότητα επίσημες διαδικτυακές αξιολογήσεις. Επίσης, κριτήρια όπως η ασφάλεια των δεδομένων, η ποσότητα της αλληλεπίδρασης που καθοδηγείται από εκπαιδευτές και η διαθεσιμότητα των διαδικτυακών ομάδων συζήτησης ανήκουν σε αυτήν την κατηγορία. Τα κριτήρια που προσδιορίστηκαν εστιάζοντας σε μια προοπτική πιο υψηλού επιπέδου αφορούν τη δέσμευση της ανώτατης διοίκησης στην εκπαίδευση και συγκεκριμένα στην ηλεκτρονική εκπαίδευση, τη δέσμευση της εταιρείας να επενδύσει στις τελευταίες τεχνολογικές τάσεις, ο συνεχής εντοπισμός των εκπαιδευτικών αναγκών με τη συμμετοχή όλων των σχετικών φορέων, η εμπλοκή των ίδιων των ναυτικών στο σχεδιασμό της εκπαιδευτικής διαδικασίας. Επιπλέον, είναι υψίστης σημασίας, καθώς προσθέτει μεγάλη αξία να φέρουμε περισσότερες εργασιακές εμπειρίες στη μαθησιακή κατάσταση, προκειμένου να αξιοποιήσουμε την εμπειρία των ναυτικών ως βάση για παραδείγματα, προσθέτοντας μια προσέγγιση με επίκεντρο το πρόβλημα στη μαθησιακή εμπειρία.

ΛΕΞΕΙΣ-ΚΛΕΙΔΙΑ: Ναυτιλία, εκπαίδευση εξ αποστάσεως, κριτήρια

1. Introduction

The goal of this thesis is to identify the criteria for the evaluation of quality standards for the online and distance learning methods applied in the maritime industry. Through the analysis of the existing literature, the available courses and material, the analysis of methods used and the best practices, the aim is to conclude in identifying the necessary characteristics of online training and distance learning maritime training as well as the criteria to be used for the evaluation.

The analysis will concentrate on identifying the relevant literature in order to conclude on the relevant and accepted Quality standards for online training and distance learning that apply in the industry where we operate, the shipping industry, and for the human element onboard the ships, the seafarers.

The project will begin with the Group characteristics and expectations and will continue with the analysis of the Group's general training policy and description of the in-house developed training center as well as the advantages of maintaining the operation of a training center in-house.

Then a literature review will follow, focusing both on distance learning and online training in general as well as on Maritime distance learning more specifically.

The training for onboard personnel of shipping companies which is mandatory as per the regulations governing the maritime industry will be examined. Not limiting to the mandatory maritime training, we will try to identify the courses addressed to seagoing personnel which nowadays are considered important and indispensable for the development of the people onboard. Furthermore, the factors and conditions affecting the online and distance training, both ashore and onboard will be assessed.

At the same time, the Training policy of Angelicoussis Group will be studied giving a focus on the policy on online training. The Group's existing processes and modus operandi on training will be analyzed. This will allow us to be able to evaluate how the Group approaches online training for its seagoing personnel.

Overall, the ultimate objective of this project is to provide to Angelicoussis Group a comparative analysis of quality standards and evaluation criteria and a justified proposal regarding the criteria for evaluation of online and distance training in the maritime industry.

2. Industry Overview

2.1 The demand side: Maritime training requirements

Shipping industry is one of the most demanding industries as far as training of ship and shore personnel concerns. This is resulting mainly from its intrinsically global nature and the complexity of the maritime profession in general. It is an industry that is governed mostly by the unified global regulatory framework that the International Maritime Organization (IMO) is setting under the approval of member states. It is worth mentioning that IMO numbers 174 countries as member states and 3 more as associate member states. Greece became a member state in 1958. Furthermore, the maritime profession requires a wide range of competences and skills which are determined by the multitasking nature of the profession as well as the unique parameter of the onboard isolation. Seafarers which combine technical and operational knowledge with managerial and interpersonal skills is the desired outcome for all onboard personnel.

Today every reputational organization is following quality criteria under ISO standards. The term ‘standard’ is a both simple and complex in definition. In the formal sense (ISO/IEC, 1996, p8) it is “a document, established by consensus, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context.”

One of the basic principles of the quality management is to provide high quality services. Through this process it becomes clear that establishing your own quality standards is not enough since you need to monitor your supplier’s and subcontractor’s quality as well. Towards this direction, shipping companies pushed by the high commercial pressure of the shipping industry (OCIMF, Intertanko, Rightship) realized that seafarers are not just workers but also “assets” that should be utilized. They started investing on their training to acquire the requisite technical background and integrate their soft skills. It is worth mentioning that initially the only prerequisite for recruitment was the demonstration of the relevant Certificate of Competence required (CoC) for each rank. During that time, the need for training was restricted to the minimum of acquiring this CoC certificate.

From the aforesaid it becomes evident that nowadays the demand for training has increased significantly covering a wide variety of types. The main drivers of increased training needs are mainly the increased regulatory requirements, the industry’s elevated safety focus, and the new technologies (MarTID, 2021). The main purposes of investing into the training are to improve productivity and performance, converting knowledge into business outcomes and elevating employees’ growth through education (Corporate Learning Network, 2014)

To further investigate what types and topics are covering the training needs of the industry it is vital to comprehend how the IMO is regulating the maritime education.

2.1.1 Principal of mandatory maritime training

The IMO in order to set the minimum acceptable standards for seafarers adopted the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) in 1978 which came into force in 1984. The STCW-78 provisions apply to ship-owners, training establishments and national maritime administrations apart from the seafarers.

The convention was amended twice since its adoption by the IMO. One time in 1995 (STCW-95) and one more time in 2010 (Manilla amendments). Amendments of 2010 were considered necessary to include new technologies, remove inconsistencies and outdated provisions and clarify misinterpretations. The STCW-78 Convention was more knowledge focused, the STCW-95 shift its interest to practical skills and competences and finally the Manilla 2010 amendments continued to emphasize in the acquired competence rather than the onboard spent period (sea service) or the period of training. The STCW-78/10 came into force on the 1 January 2012, with a five-year transitional period until 1 January 2017.

The convention is outlining the legal responsibilities that must be met by each party with technical details on how they should be met and specifies in more depth the technical details in Parts A & B as follows:

Part A:

Mandatory standards of training, certification, and watch-keeping.

Part B:

Recommended guidelines (not mandatory) on training, certification and watch-keeping.

The Manilla amendments only refer to the following certifications:

- 2.1.1.1 Certificate of competence (CoC) according to your rank and functions on-board
- 2.1.1.2 Certificate of proficiency (CoP) to meet various vessel types & requirements and
- 2.1.1.3 Documentary evidence (any other documentation than a certification of competency or certificate of proficiency used to establish that the relevant requirements of the convention have been met).

The biggest change that STCW-78/10 introduced, to the extent of the current project analysis, is the introduction of modern training methodology including distance learning and web-based learning. The administrations may now allow the training of seafarers by distance learning and e-learning in accordance with the minimum standards provided in section A-I/6 & B-I/6, something that was strictly prohibited before.

In section **A-I/6** Convention is setting standards regarding:

- 1) training and assessment of the seafarers,
- 2) qualifications of instructors, supervisors, and assessors',
- 3) in-service training & assessment of competence and
- 4) Training and assessment within an institution

In section **B-I/6** Convention provides some extra guidance on qualifications of instructors and assessors as well as in-service training and assessment and further to the fact that it officially recognizes the use of distance learning and e-learning as an educational option for maritime training is also setting minimum requirements and guidance for this purpose (*For extensive illustration of STCW sections A-I/6 & B-I/6 please refer to Appendix V*).

The STCW therefore is now providing the distance learning options to the seafarers and thus member states can adopt this method to comply and fulfill the requirements of the convention.

Particularly asynchronous training could be employed for the training of seafarers both during their time at sea and on shore, for example in maritime school training facilities, or in the facilities of maritime centers, or company premises if equipped with the necessary tools.

Academic surveys support that the learning effects of traditional onshore training and digital learning can have similar results. And indeed, the training courses for the STCW can be delivered fully from distance in the future. According to Ki Yin et al “the learning methods for STCW courses can be directly used for non-synchronized computer training, and the training courses, such as Ro-Ro passenger ship training and Ship security officer training, belong to the subject knowledge of training courses and can thus be carried out directly through the use of non-synchronized computer training. Most STCW training courses will also require a certificate of competency after operational simulation. Some of the courses that require operational simulation can make use of analog systems. These include Radar navigation, Radar plotting and the use of ARPA, ECDIS, and Leadership and bridge resource management. However, some STCW training courses are not able to use the simulation system for training when it is necessary to implement operational simulations. These include Basic training, Medical first aid, General operator’s certificate for GMDSS, Basic training for oil and chemical tanker cargo operations, etc.

In the same paper, they introduce a flowchart of web-based learning for STCW training courses as per figure 3 below:

Figure 3: Flowchart of web-based learning for STCW training courses

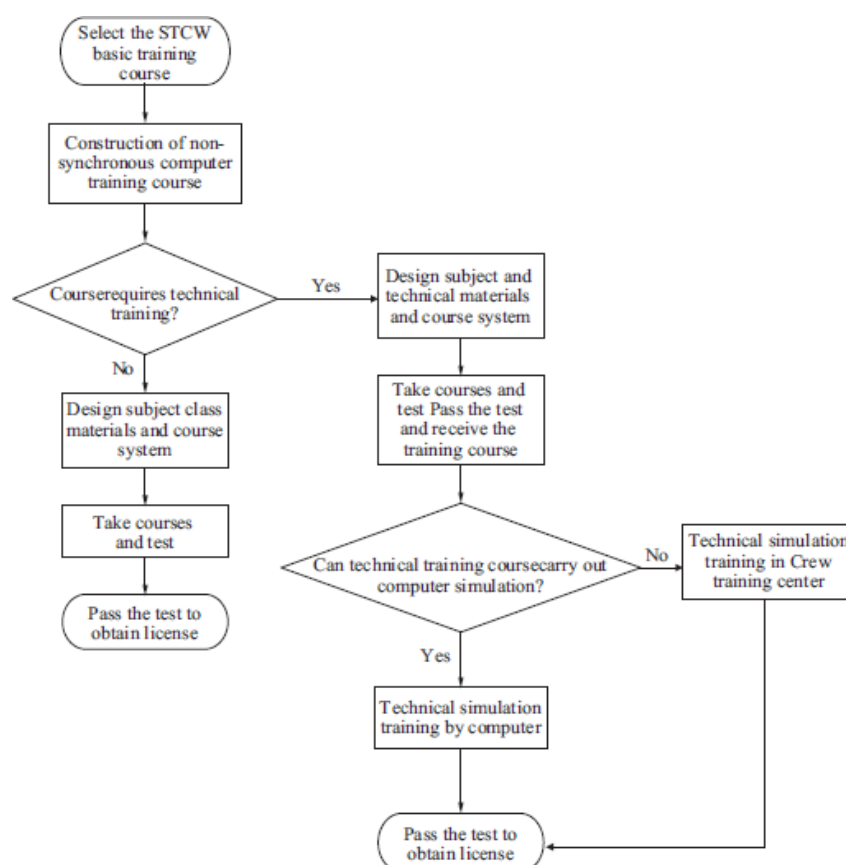


Fig. 1. Flowchart of web-based learning for STCW training courses.

Source: Ki Yin et al (2019)

In conjunction to the above the training needs to be fulfilled are divided into mandatory and non-mandatory. In this respect it is the STCW mandatory training (CoC & CoP) related to the rank or the task to be performed which should be approved and endorsed by a Flag administration as required by STCW and the non-mandatory training. Demand can be met by public or private maritime training centers as it is going to be analyzed further below.

Mandatory training

Mandatory requirements are generally divided into two different categories for officers and ratings. Officers should meet minimum requirements in respect of standards of competence, seagoing service time, medical fitness, and age. According to your rank and functions on-board officers must be holders of a valid certificate of competence as well as other ancillary certificates endorsed by the respective issuing administration as per STCW convention chapters II (master and deck department), III (engine department), IV (radio personnel), V (training requirements for personnel on certain types of ships), VI (emergency, occupational safety, medical care and survival functions) of the STCW Convention. Those certificates upon their issuance are subject to revalidation at intervals not exceeding five years. Specialized training certificates are subject to refresher training.

Ratings are sub-divided into three lesser categories: The ones forming part of a watch (deck or engine), those who are not assigned watch-keeping duties, and those undergoing training. Minimum standards regarding medical fitness, minimum age (if assigned watch-keeping duties), competence (if assigned watch-keeping duties), and seagoing service time (if assigned watchkeeping duties). If ratings are not designated with watch-keeping duties or still undergoing training they are not required to hold watch-keeping certificates. STCW Convention chapters II (master and deck department), III (engine department), IV (radio personnel), V (training requirements for personnel on certain types of ships), VI (emergency, occupational safety, medical care and survival functions) fully describe the mandatory certification for each rating.

Following the adoption of the STCW, IMO, developed a series of Model Courses to help implement the Convention and facilitate access to the knowledge and skills demanded by increasingly sophisticated maritime technology.

Each model course includes a course framework (detailing the scope, objective, entry standards, and other information about the course), a course outline (timetable), a detailed teaching syllabus (including the learning objectives and competences that should have been achieved when the course has been completed by students) and guidance notes for the instructor (*please refer to Appendix V with full list of available IMO model courses*).

2.1.2 Non mandatory maritime training and industry standards

Further to the mandatory requirements the STCW is setting as analyzed above emerging from the prerequisite competencies and assigned duties per rank there are also the following non-mandatory training programs within the convention:

2.2 B-V/a – Guidance regarding additional training for masters and chief mates of large ships and ships with unusual maneuvering characteristics.

2.3 B-V/b – Guidance regarding training of officers and ratings responsible for cargo handling on ships carrying dangerous and hazardous substances in solid form in bulk.

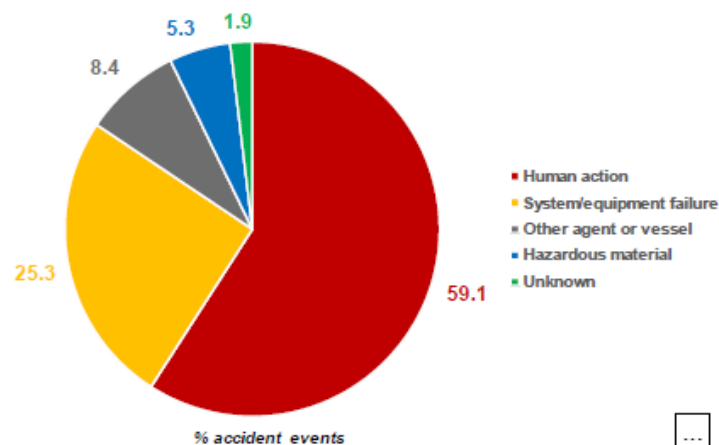
- 2.3.1.1 B-V/c – Guidance regarding training of officers and ratings responsible for cargo handling on ships carrying dangerous and hazardous substances in package form.
- 2.3.1.2 B-V/d – Guidance on application of the provisions of the STCW Convention to mobile offshore units (MOUs).
- 2.3.1.3 B-V/e – Guidance on the training and experience for personnel operating dynamic positioning systems.
- 2.3.1.4 B-V/g – Guidance regarding training of masters and officers for ships operating in polar waters.

There are still many training programs over and above the STCW minimum requirements as demonstrated further below in our analysis that emerge from each maritime sector advanced training needs. As already mentioned, one of the key drivers of training is the industry's safety focus (MarTID, 2021). Maritime industry's focus on safety is deriving from the fact that although minimum requirements are met incidents and accidents continue to occur.

The contributing factors are revealed in the European Maritime Safety Agency's (EMSA) annual overview of marine casualties and incidents for 2023. EMSA is the European Union's dedicated agency for maritime safety, maritime security, prevention of and response to pollution caused by ships as well as response to marine pollution caused by ships and by oil and gas installations. EMSA is annually gathering and analyzing statistics regarding casualties and incidents following the EU accidents investigation directive since 2011.

As described in figure 4, 59.1% were attributed to a human actions' category and 25.3% to system/ equipment failure.

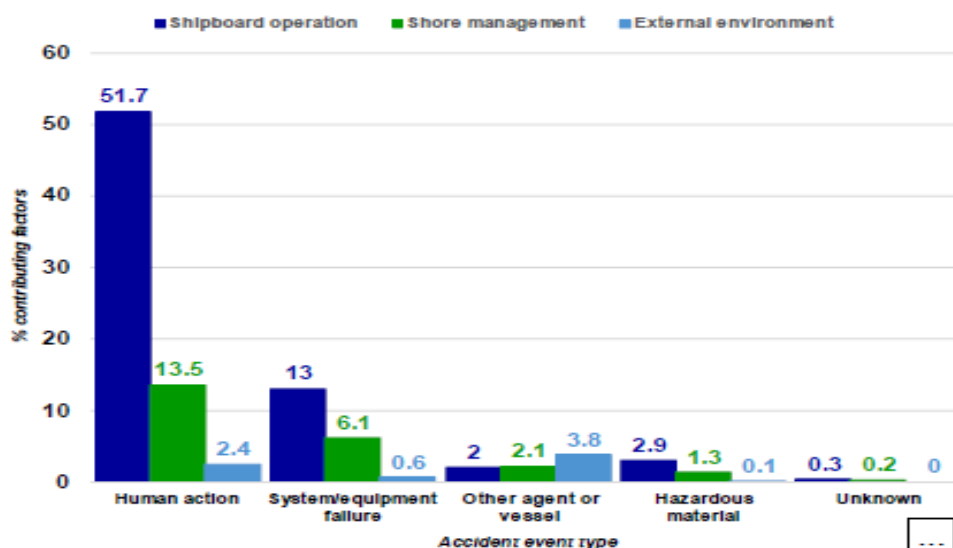
Figure 4: Distribution of accident events for 2014 - 2022



Source: EMSA - Annual overview of marine casualties and incidents (2023)

Moreover, in figure 5 are illustrated the contributing factors that contributed to an accident event or worsened its consequence. Contributing factors related to "Shipboard operations" represented the main group with 69.9% of all the contributing factors, Human action' is the main accident event type, with 67.6% of all the contributing factors, followed by 'System/equipment failure' with 19.9% of all the contributing factors. When this distribution is analyzed individually for every ship type for the period from 2014 to 2022, almost the same trends are found for all the ship types.

Figure 5: Relationship between accident events and the main contributing factors for 2014 - 2022



Source: EMSA - Annual overview of marine casualties and incidents (2023)

From the above investigation analysis becomes evident that certified competencies do not guarantee zero incidents. Furthermore, competencies are not considered enough since factors such as communication, mental/psychological state, planning/coordination and safety awareness seem to heavily affect the safety onboard vessels. Towards this direction the industry embraced initiatives promoting safety and crew training on higher than the mandatory standards. Human factor has come into the spotlight thus investing on the development of soft skills in addition to hard skills for crews became of paramount importance for all involved parties.

The tanker sector due to its peculiarity of transported cargoes and mainly due to the bad reputation that has granted from famous incidents that had great environmental impact is among the leader sector in promoting high safety and training standards. It is worth mentioning that it is the only sector within marine transportations that has a self-assessment program for the management of tanker operating companies (TMSA) which exceeds International Safety Management Code (ISM) requirements adopted by the Oil Companies International Marine Forum (OCIMF).

OCIMF is a voluntary association of oil companies with an interest in the shipment and terminalling of crude oil, oil products, petrochemicals and gas. OCIMF focuses exclusively on preventing harm to people and the environment by promoting best practice in the design, construction and operation of tankers, barges and offshore vessels and their interfaces with terminals.

OCIMF realizing that in order to promote onboard safety culture and minimize the human factor's contribution on incidents there should be a parallel investment on crew's soft skills rather than technical skill described in STCW. For that reason, they introduced in 2018 in cooperation with the International Association of Independent Tanker Owners (INTERTANKO) the Behavioral Competency Assessment and Verification for Vessel Operators program. The scope of this initiative is to:

- 1) Highlight the importance of the soft skills dimensions of competency in performing operations incident-free and safely

- 2) Describe soft skill variety and their associated behaviors
- 3) Identify behaviors to be adopted and to be avoided and
- 4) Explain the value of having a variety of soft skills and behaviors in a team, which when harmonized boosts performance.

The soft skills competency frame is formed by the following main domains:

- 1) Teamworking,
- 2) Communication and influencing,
- 3) Situational awareness,
- 4) Decision making,
- 5) Results focus and
- 6) Leadership and managerial skills.

The program is providing guidance on how companies can assess soft skills in order to fit each company's needs. Therefore, the vessel operators may choose what to combine or delete to suit its system.

Large oil major companies which are one step ahead in safety have introduced their one training programs towards the same direction. British Petroleum (BP) has promoted within her circles the Behaviors Based Safety (BBS) program. BBS is not a program that aims to replace training. On the contrary it works ancillary with training. It is a systematic process to identify, measure and change seafarers' behavior towards safety by examining the motivation underlying different behaviors. It is about safe and at-risk behavior of all employees and emphasizes on the kind of behavior that contributes to accident-free environment reflecting an ongoing and proactive approach to safety. It aims to find root causes of accidents and the related behavior as well as creating a working environment that encourages workers to collaborate because they want to and not because they have to. It focuses on the behavior of each individual and considers safe behavior as a competence. (Ventikos et al., 2014). The program is running under the following main principles:

- Look for external factors to understand behavior
- Direct with activators and motivate with consequences
- Focus on positive consequences to motivate behavior
- Apply methods to improve intervention
- Design human-oriented interventions
- Focus intervention on observable behavior

It is totally voluntary program, that has no disciplinary impact on the participants, everything is reported anonymously, and it is based on seafarers who conduct observations during vessel normal operation. Whenever the seafarer observes an unsafe act, he is free to interrupt the job task performed and express his concerns. He may later anonymously and voluntarily report his intervention (Ventikos et al., 2014).

Furthermore, Shell introduced an even more holistic approach in onboard safety. The Resilience training program. Resilience is the core ability to bounce back and effectively deal with problems and challenges in day today life as well as high stress situations. Shell identified that work in a hazardous industry and the way we think is critical into keeping ourselves, teams, assets and environment safe. By learning more about how we think under pressure and increasing our resilience, we learn an important skill that helps us work safely. Learning resilience techniques give you several ways to cope, so if one doesn't work, you can use another way. The program aims into practice your resilience skill and enhance it like any other skill in order to become more resilient thus safer for you and your onboard teammates. Resilience is considered as the base of her initiative

towards a Zero Incident Industry as illustrated in Shell Resilience Program guidelines (figure 6).

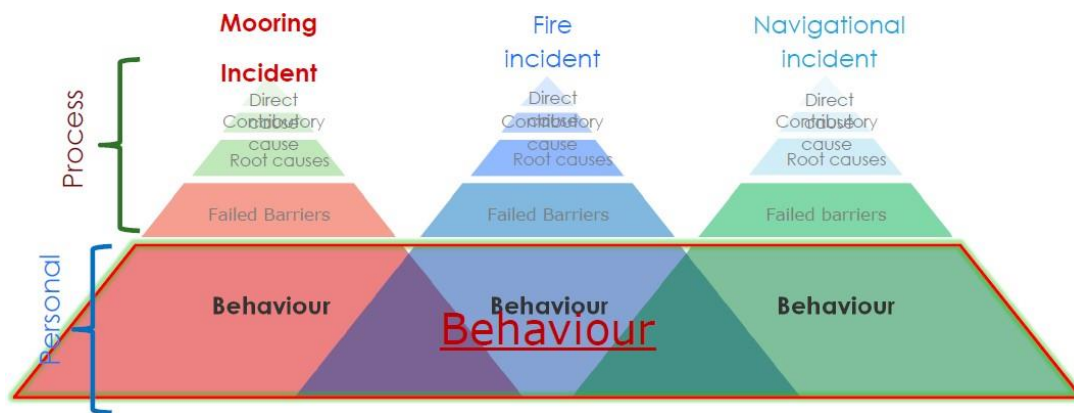
Figure 6: Shell resilience training program



Source: Shell (2020)

Shell is recognizing that seafarers' due to the peculiarity of their profession exposed to dangerous working environment under isolation are emotionally vulnerable. This vulnerability may affect their attitude and mental health. Subsequently their state may have an impact into their everyday working decisions or actions which may lead to unsafe behaviors. For Shell unsafe behavior is what underlies the majority if not all incidents (figure 7).

Figure 7: How Shell's Reflective Learning help develop a Safety Culture through behavioral change



Source: Shell (2020)

Under resilience program initiative onboard personnel are divided into small groups of 6-8 persons where one is the facilitator of the program and the rest are assigned as the participants. It is important that the facilitator is someone that crew feel comfortable with thus Master or Senior officers should not be facilitators but just participants. There are handouts for the facilitator and the participants covering several discussion topics. Indicatively but not exclusively we refer to the following modules:

- Change is a Part of Living
- Looking at Situations in a Different Way
- Take Care of Yourself
- Take Decisive Action
- Dealing with a Crisis
- Maintaining a Hopeful Outlook
- Making Connections
- Connection to Home
- Gratitude
- Positive Connections

There are some related exercises that assist the team to further elaborate on the module and let everyone freely express his opinion and view. Each participant is using the participants module printed guide for taking notes with his answers on each exercise.

Resilience program is supported by the Reflective training program which is implemented simultaneously. The reflective training program focuses into the following to methods. The learning from incidents (LFI) and the learning engagement tools (LET) methods. The LFI is a session which takes place on board vessels and is coordinated by the assigned “Trainer”, where the team discusses a real case study which has led to serious incident. It aims is to encourage the group to embed learnings from incidents through open dialogue. The LET method focuses on an interactive session as well. However, trainees discuss their experiences on various topics which relate to vessels’ daily operations (such as engine failures, moorings, lifeboat operations) in order to gain a better understanding on important issues which may happen in the future and thus improve employees’ and crew’s preventive attitude and reactions to potential incidents. The program is also requesting company’s participation since leadership attendances onboard and participation is mandatory. For the participating companies, Shell may send auditor’s onboard vessel’s and verify program’s implementation any time (Shell, 2020).

Both BBS and Resilience training programs up to know were implemented using the traditional face to face way during seaman’s disembarkation periods or by shore personnel visits onboard. There was no need for that to change. After the COVID-19 imposed restrictions new distance learning programs were introduced to cover this need. In addition, video & telephone conferences have been implemented from shore personnel end to satisfy the training requirements. COVID-19 seems to be the catalyst of evolutionary changes on training methods.

Non mandatory training is not as non-mandatory as the title perceived us. Actually, non-mandatory training programs provided to crewmembers are adding value to the employees and the company itself. That is why, as demonstrated in our analysis below, the need for further training is exponentially increasing and this increase for training is also dragging the need for distance/e-learning to be increased as well.

2.2 The demand side: Seafarer as a learner

The seafarer’s profession as well as the environment and conditions onboard the ship constitute themselves basic challenges that can be recognized in the maritime industry. These can constitute implications as we have the involvement of challenging factors such as a highly diversified workforce, remoteness of working environments, multicultural crew members, and often cases of fatigue that can discourage the seafarers to engage and commit in learning processes. The critical dimensions that can have a direct impact on the psychological state of the seafarer that will definitely affect his/her performance during the training also lay upon the different nature of the seafarer’s job.

Inter alia, the factors that can have an impact on the psychology and seafarer’s performance can be the culture shock, especially during the first days of the trip, the isolated working environment onboard, the lack of spouse and family support, personal and emotional problems, the period necessary to adjust on the vessel and the period of familiarization to the company’s practices – when it is the first trip in a new company, the long hours of work and the extra effort to adjust to the new reality and work environment related factors.

Furthermore, attending a distance/e-learning course has some technical difficulties which implies obstacles to the training process itself. These obstacles for seafarers may not be possible to be overlapped due to the nature of the specific profession and the difficulties that they face in their

everyday life. As Bauk et. al., (2013) revealed in their research the most important obstacles in the introduction of distance learning to seafarers was the internet reception. Wi-Fi coverage although it is taken for granted for most workers is not something standard for the seafarers. Using satellite internet is not certain since global coverage is not available and the signal is affected by many factors such as weather conditions, vessel's rolling/pitching and blind sectors. Another issue is that the satellite connection is setting limits both in speed as well as the volume of the transferred material. It is worth mentioning that even though satellite internet service rates have been significantly reduced during the last five (5) years they are still way far expensive than the shore internet service tariffs. Due to the above difficulty in communication the sense of inability to interrupt during the lesson and ask raise questions to the instructor as well as get in touch with him to discuss any concerns or express inquiries deteriorates. Even if the course is providing a support squad to solve technical problems that may occur, communication difficulties may render them useless.

The same problem may occur while seafarers are disembarked and they are remotely monitoring the course from home. Not all countries where seafarers come from have well developed internet services. Since multinational crews are used onboard vessels, most companies have employees from various countries. Although a common language is used onboard not all seafarers share the same level of understanding the English language (which is the most common language onboard). For the standard terminology used onboard the basic knowledge of English may be sufficient but for understanding a whole course designed in a foreign language basic understanding will be insufficient. It worth to note here that if the course is taking place during seafarers' disembarkation his/her engagement to the training course will be low as the trainee feels that some of his personal time for relaxation has been sacrificed.

The same research illustrates that the nature of the maritime profession is not only setting obstacles to the implementation of the distance/e-learning also provides opportunities to use personalized and flexible (in time and place) paths, while ensuring the achievement of learning outcomes. The possibility of attending remotely while onboard, the reduction of travelling costs, the saving of time from attending a traditional course, the easier and direct access to the training material and finally the possibility of self-assessing through on-line tests are considered, by the seafarers, the most vital advantages in relation to their unique profession limitations (Bauk et. al., 2013).

In addition, the presentation of content can be more flexible than in traditional classroom-based environments, exploiting online information sources as well as video and audio channels. E-learning courses offer an opportunity for considerable flexibility to pass on knowledge to the seafarers as they can access the training material at their own pace, meaning that this constitutes an attractive solution for the maritime industry where the opportunity is offered to either conduct the training on board or to attend the course during the mariner's time off.

It is worth to remember that even when onshore, Maritime Training also involves difficulties and challenges due to factors like reduced incentives and lack of motivation, lack of engagement. Also, non-advanced IT skills could be a barrier. From the organization's side lack of experienced and specialized professors, high training costs, monetary resources and budget allocation can be a challenge.

2.3 The supply side: Maritime training providers

The above-mentioned demand for training created a large space for entrepreneurship in the maritime training sector. Various organizations, public and private, specialized in the maritime education are exploring various methods of training. Maritime training centers and institutes, classification societies and universities are among those providing specialized training for seafarers. Apart from those there are also numerous shipping companies (operators) which have introduced in-house training in an effort to cope with the increasing training needs and expenses. Some operators have managed to turn their know how on maritime training into competitive advantage by providing training services to other operators.

For the purpose of collecting data on industry training practices the team referred to the Maritime Training Insights Database. MarTID is a new non-commercial initiative collaboratively founded by the World Maritime University, New Wave Media and Marine Learning Systems. The purpose of this initiative is to contain anonymized and secure data on industry training practices, foci, and outcomes. This database is providing a global picture of maritime training exposing invaluable data on current and emerging training trends and techniques, staffing models, training focus areas, training tools, training resource allocation, assessment practices and so on.

As the Maritime Training Insight Database (MarTID) survey for 2021 reveals the methods used by the above-mentioned organizations are also significantly varying. Utilized training methods are as follows:

- 1) Face to face classroom teaching
- 2) Video e-learning
- 3) Internet e-learning
- 4) Simulation
- 5) Tabletop exercises
- 6) Job shadowing
- 7) Mentoring
- 8) Coaching

As per MarTID survey for 2021, vessel operators face to face classroom teaching and job shadowing are the predominant methods training. Interesting fact is that 53% of operators declared high to medium use of e-learning with video sources, and approximately 76% reported the same for online e-learning. Worth highlighting that all vessel operators declared at least some use of internet-based e-learning usage.

On the other hand, for the METI the predominant methods are traditional classroom teaching and simulator training followed by coaching. There is significant differentiation on the usage of tabletop exercises for training methods though where METI seem to be fonder of this method although tabletop drills are a very common training method for the maritime industry. The video and internet e-learning, percentages do not differentiate greatly from the vessel operators.

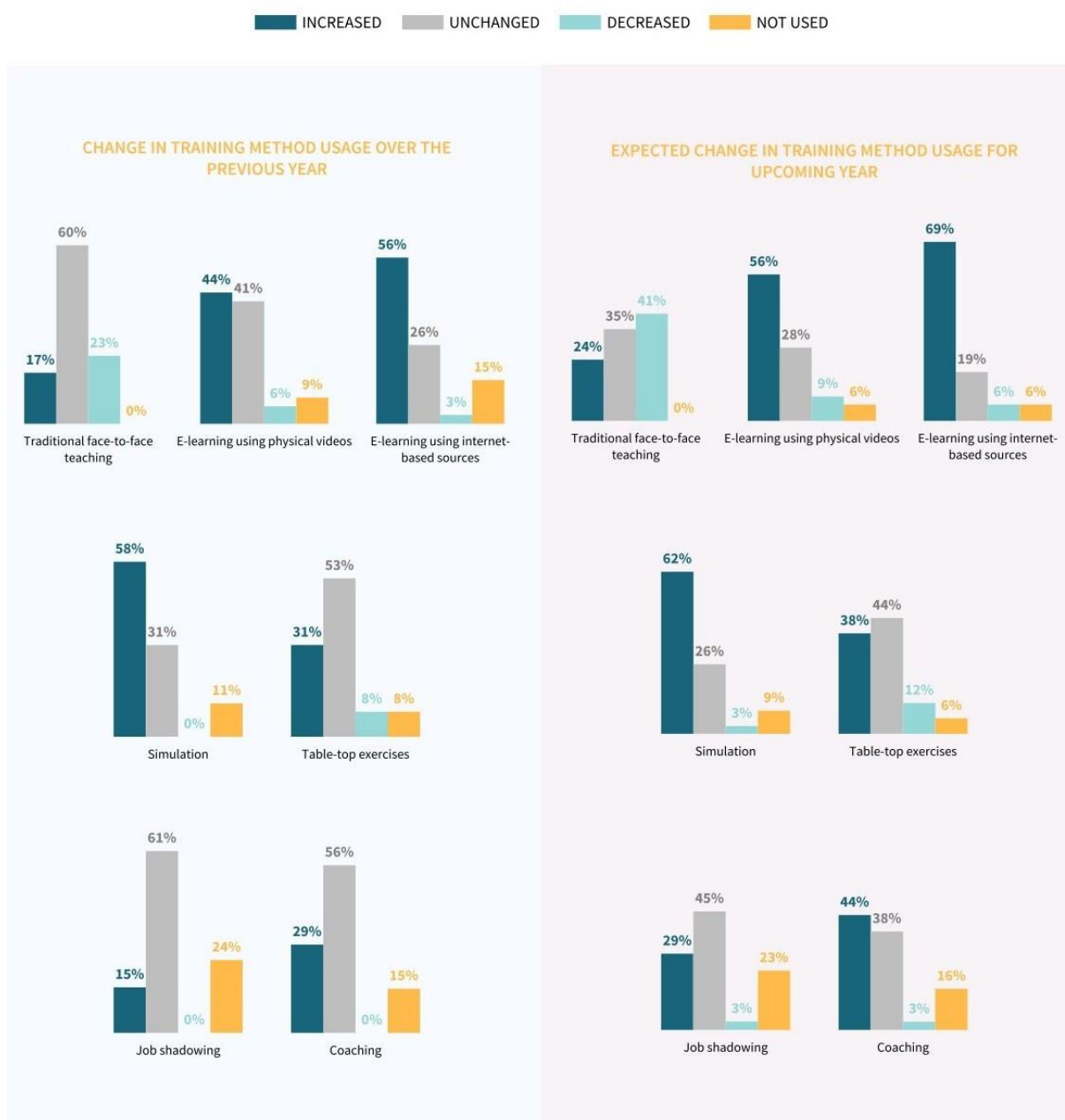
Another interesting aspect of this survey is revealed on figures 8 & 9 where it becomes evident for both surveyed parties that they already changed their teaching methods to a great extent over the past year and their intention is to further increase their preference on e-learning and video e-learning methods while decreasing their reliance on the traditional methods like face-to-face teaching and job shadowing amongst vessel operators in the upcoming years.

Figure 8: Vessel Operators - Change in training methods usage over the past year & expected change in training methods usage for the upcoming year.



Source: MarTID Survey (2021)

Figure 9: METI - Change in training methods usage over the past year & expected change in training methods usage for the upcoming year.



Source: MarTID Survey (2021)

The training trends of the present time and near future as described by both vessels operators and METI are also described in the same research:

Vessel Operators

Present:

- Increased or new simulation training
- Virtual realities
- Regulatory approvals for digital training/e-learning
- Expanding training division
- Implementation of Competency or Learning Management Systems (LMS)
- Additional courses and safety training
- Digitalization (digitizing data and/or processes)
- Incident investigation
- Implementing a SMS

Future:

- Implementing more virtual reality simulation
- More leadership & technical training
- Assessment programs
- Implementation of CBT and e-learning programs
- Increase in supervisor-led training, assessments and performance evaluations
- Additional training & assessments on various subjects
- Implementation of an SMS

Maritime Education and Training Institutions

Present:

- Implementation of SMS or LMS
- Outcome based teaching & learning
- Additional safety training
- Regulatory approvals for digital training/e-learning
- Virtual reality for various subjects
- Web based platforms
- Applying IMO model courses & methodology
- Navigation training
- Incident investigation techniques
- Polar navigation training
- Leadership training

Future:

- Migrating traditional classroom learning content to e-learning, increased e-learning
- Improving skills acquisition
- Dedicated ship training
- Increased simulation and practical training
- Using gaming technology in training evaluations
- Increased sea service time spent onboard and increase college time
- Increase of tabletop exercises

Furthermore, the need to complement and partly replace the traditional training methods with technologically advanced distance learning methods (synchronous or asynchronous) which do not require the physical presence of the trainee, is imperative. Towards this direction the maritime training providers are altering their preferences respectively to cope with the increased demand. The quality of the provided services also varies since that are not set standards by any organization. Even the International Standard Organization (ISO) although has established some quality standards those have to do more to the quality of the management system of the organization (ISO 9001, 21001, 29993) than to the outcome.

So, the burden falls on the customer (company, vessel operator) to weight the options and alternatives and finally decide which training method suits his training needs considering the following parameters:

1. STCW requirements
2. competencies and skills needed
3. organizational vision, mission and culture
4. training budget
5. the effectiveness of training

3. The Group

3.1 Group characteristics and expectations



The Angelicoussis Group Limited ("ASGL") has a well-established track record in shipping dating back to 1947. Antonis I. Angelicoussis founded the business in 1947. Today, the Group is managing 137 Ships in total with an orderbook of another 17 (Our History, 2019).

The Angelicoussis Group states as its key mission to transport commodities across the globe in a safe, efficient, and reliable manner. The Group aims to provide first class shipping services and to create innovative business solutions for its customers whilst applying fair employment practices both at sea and ashore ASGL contains the below shipping companies: Maran Dry Management Inc. ("MDM") is the Dry Bulk Carrier Shipping unit of the Angelicoussis Shipping Group Limited



("ASGL"). Maran Dry Management Inc. ("MDM"), was established in 2001 and is appointed to take over the commercial, technical and operational management of BulkCarrier fleet of ASGL (Maran Dry Management Inc. | Committed to safe, clean and efficient Bulk Carrier Operations, n.d.)

The company currently has 47 vessels under its management (38 capesize, eight mini cape and one VLOC) also having three capesize vessels under order. The majority of the fleet (40 vessels) is under the Greek flag, six vessels operate under the Malta flag and one vessel is under Liberia flag. The three new buildings under construction are under the Greek flag while the Company's fleet has an average age of eight years (Maran Dry Management Inc. | Fleet List, n.d.)



Maran Tankers Management ("MTM") is a successful and modern Tanker Management Company operating worldwide with the aim of safely carrying oil for its customers.

Maran Tankers was established in 1992 and today, the Company operates to the highest standards, offering first class service to their customers in terms of safety, navigation, cargo handling, commercial responsiveness and customer focus (Maran Tankers Management Inc., n.d.).

The Company currently has 45 vessels with Greek Flag & one vessel under Marshall Islands flag under its management and has six vessels under order). In addition, the Company's fleet has an average age of 7.8 years and its capacity is 13,603,598 DWT (Maran Tankers Management Inc. | Fleet, n.d.).

Maran Tankers Management ("MTM") newbuilding vessels embrace the latest technical innovations within the shipping and the tanker industry in particular, incorporating the latest technology while a practical approach to ship operations and the human interfaces, as well as industry best practices, are applied from the management side.

Focusing on the Company's approach towards its Human Resources, the Company is committed to creating a positive safety culture, which involves developing values, attitudes, competencies and patterns of behavior in groups and individuals.



Maran Gas Maritime Inc. ("MGM") is the Gas Shipping unit of the Angelicoussis Shipping Group ("ASGL"). The company was set up in July 2003 to undertake the commercial, technical and operational management of LNG carriers (Maran Gas Maritime Inc., n.d.). Maran Gas Maritime Inc. ("MGM") currently has 45 LNG Vessels under the Greek flag and has ten vessels under order. The Company's fleet is quite modern and has an average age of three years and 11 months (Maran Gas Maritime Inc. | Fleet Overview, n.d.)

All Group Companies' mission is focused on providing world-class ship management services that meet or exceed safety, environmental, and customer demands which are executed in a manner that protects human health, the environment, and property. Also, the Group implements assessment and mitigation of all risks and applies the industry best practices while establishing safeguards to ensure flawless and risk-free operations (Maran Dry Management Inc. | Our Mission, n.d.-a, Maran Tankers Management Inc. | Our Mission, n.d., Maran Gas Maritime Inc. | Our Mission, n.d.)

All Group Companies share the vision to become the top firm in the world for every segment of the shipping industry respectively, offering high quality services to their clients while ensuring efficient transportation for all kinds of cargoes and safeguarding the highest applicable health, safety, and environmental standards. Also, Maran Dry, Tankers, and Gas aim to accomplish the goal of ZERO accidents, ZERO oil spills to the sea, ZERO loss to process, ZERO lapses in security, through continual improvement (Maran Dry Management Inc. | Our Mission, n.d.-b, Maran Tankers Management Inc. | Our Vision, n.d., Maran Gas Maritime Inc. | Our Vision, n.d.).

All Group vessels are manned mainly with seafarers from Greece, the Philippines, Romania, and Ukraine. The selection and hire of sea and shore staff are carried out under a specific company process with strict criteria which combined with the Delphic MTC training programs has as a result the sea and shore-based personnel to meet or exceed the minimum mandatory requirements of the Flag Administrations.

On a last note, ASGL has established for its seafarers an innovative crew wage scheme, keeping officers in payroll even for the period that they are on vacation (stand-by wages) and award crew loyalty with extra seniority bonuses. All Companies cover in full all crew training expenses in-house (DELPHIC Maritime Training Center).

The approach of the Group towards training – which will be extensively analyzed in the sections to follow-, demonstrates its approach towards its Human Capital. The way that the Group deals with the training of its people can depict its commitment to investing in their development by providing

continuous and high-quality training - for all companies and to the entire personnel ashore and onboard.

3.2 Group general training policy

The Angelicoussis Group has founded its own in-house training center in 2004, the DELPHIC Maritime Training Centre (DMTC), to provide training to both ships and shore-based personnel for all companies of the Group while it was the first in-house certified training center that was established by a Greek shipping company. Also, back in 2004, very few shipping companies in Europe had their own in-house training facilities. It is important to clarify that only for internal, operational, and accountable purposes DMTC is considered as Maran Tankers Management (MTM) company proprietorship. However, DMTC is responsible and provides training to all sea and shore Group personnel (Maran Dry Management Inc. | DELPHIC Maritime Training Centre, n.d.) DMTC states as a vision to remain a leading in-house training center while adding value to the Group through continual improvement with developing and deliver company-specific high-quality training courses. The big challenge for DMTC is to provide training that is appreciated by the participants, improve their knowledge and competence, and not reflect and cover the obligation for compliance only.

DMTC is considered a modern training unit, which includes a full mission bridge simulator, ECDIS simulator, PC based Engine, Cargo, and Liquid Cargo for LNG Operation simulators.

DMTC was equipped with a POLARIS KONGSBERG bridge simulator in 2007 and upgraded with tanker cargo and engine KONGSBERG simulators in 2009, ECDIS simulator in 2012 and LNG L3 cargo simulator in 2013. In 2018 the Group moved to the new infrastructures as resulting in DMTC to improve its simulator tools with the contribution of a KONGSBERG KSIM Bridge and engine simulators. The full operation of the new facilities of the department started in Q3 2018. Engine and tankers cargo simulators via cloud started being used in 2020 and have continued ever since. ARI bulkers cargo simulator was also introduced in 2022. In December 2022 the old POLARIS bridge simulator was replaced with a new KSIM KONGSBERG full mission bridge simulator. In June 2023, K-SIM Engine and tankers cargo simulators were upgraded and KONGSBERG engine ME-GI model was added. (DELPHIC MTC Annual Report 2023).

Currently DMTC is equipped with following simulators:

- 1) Two K-SIM Full mission bridge simulators with 4 workstations each, total 8.
- 2) Two K-SIM Engine simulators, one with big view touch screens and 6 workstations, with 4 engine models, and one PC based with 2 engine models and 6 workstations. Engine simulator can be provided via cloud as well.
- 3) ECDIS simulator (for Generic, JRC and FURUNO type specific)
- 4) KONGSBERG Cargo simulator PC based, for tankers with 6 workstations (can be provided via cloud as well since 2020 with 7 licenses)
- 5) G-sim GTT cargo simulator for LNGs, PC based with 6 workstations (can be provided via cloud as well since 2020 with 8 licenses),
- 6) ARI Bulkers Cargo & Ballast Handling Simulator, cloud based with 6 workstations, since 2022. (DELPHIC MTC Annual Report 2023).

Except for the simulator rooms, the rest in-house courses that offered are divided into several categories as follows:

- Generic Technical Courses (e.g. surveys and certification, various standards 14001, 18001, 50001, Fire Safety Systems, ECDIS Generic, Incident investigation, Risk Assessment, Environmental issues, MAPROL, PSC and vetting, Tankers Operation, etc.)

- Specific Technical Courses (e.g. STS Transfer, Boilers, Gas Detectors, Use of Chemicals, SIGTTO competence standards, Lifeboats release gear, Ship Safety Officer, In-house SMS familiarization, Refreshing Courses, Oil Record Book, Bunkers, etc.)
- Managerial Courses (e.g. Bridge Team Management, ER Resource Management, etc.)
- Interpersonal Skills Courses (e.g. Train the Trainer, Communication, and Teamwork, Handling the Media, etc.)
- Other Courses (e.g. First aid, Meteorological Charts, IT and Internet onboard, E-NOA, Digital Editions, Anti-piracy, etc.) (DELPHIC MTC Annual Report 2023).

Furthermore, DMTC is approved and certified by:

- From the Maltese Maritime Administration in accordance with their Guidelines for Approval of Maritime Training Centers SCU/040 (2009) and Approval of Maritime Training Courses SCU/003 (2009). (The approval refers to STCW courses on ECDIS Generic training IMO Model Course 1.27 2012 and the course “Medical Care Refresher”, both approved in 2017 till 2027)(*please refer to Appendix I*)
- DNVGL in accordance with the DNVGL Standard for Certification of Maritime Training Providers ST-0029 (2009), certificate is valid until 2022(*please refer to Appendix II*).
- DNVGL in accordance with the DNV Standard for Certification of Learning Programs no 3.201 (2011) for 2 courses, “SIGTTO Competence Standard” which was renewed in January 2018 for 5 years and “Liquid cargo simulator for LNGs LICOS”, is valid until 2028 (*please refer to Appendix III*).
- Is approved by JRC for conducting the JRC ECDIS Type Specific training. Internal audits were carried out as required (DELPHIC MTC Annual Report 2023).

3.3 DELPHIC MTC in numbers

In continuation, DMTC successfully executed its activities in 2023 with an increased number of seminars and participants from Maran Dry, Tankers, and Gas as well as from the Group’s offices. The following table (1) shows the number of seminars and attendances per company for 2023, both in-house and external:

Table 1: Inhouse & external seminars and attendances per company for 2023

2023	Seminars / courses in-house + external (participation in seminars out of 15.419)	Deck officers	Engine officers	Ratings	Office staff	Total
MTM	(990)	3970	2994	177	577	7718
MGM	(819)	1846	1505	910	344	4605
MDM	(779)	1321	1059	318	398	3096
TOTAL	1422	7137	5558	1405	1319	15419

Source: Delphic MTC Annual Report 2023

Above table includes courses provided by DELPHIC (actual and remote) and courses coordinated by DELPHIC but provided by external providers eg KONGSBERG, MAN, NORSAFE, DNV, HELEXCO, KATRADIS, KORONAKIS, GTT, MTSC, JOTUN, POSEIDON, DYNAMARINE, makers of equipment etc. Following courses are not included in the table above: ECOCHLOR

courses onboard vessels on the ballast treatment system, MTM HSQE Combo, SIGTTO Form B,(Iconic record for the SIGTTO certificates issuance only), participations in e-learning (DELPHIC MTC Annual Report 2023)(To review the full list of training courses provide by Delphic MTC please refer to Appendix IV).

The following table (2) represents the number of certificates that issued from the training center of the Group in 2023:

Table 2: DELPHIC MTC issued certificates for 2023

	Various courses	ECDIS Generic	SIGTTO	LICOS	MEDICAL CARE	IGF BASIC	IGF ADVANCED	Total certificates
Number of certificates issued by DELPHIC in 2023	11223	152	57	135	41	106	79	11793 (6306 in 2022) (4913 in 2021) (3459 in 2020)

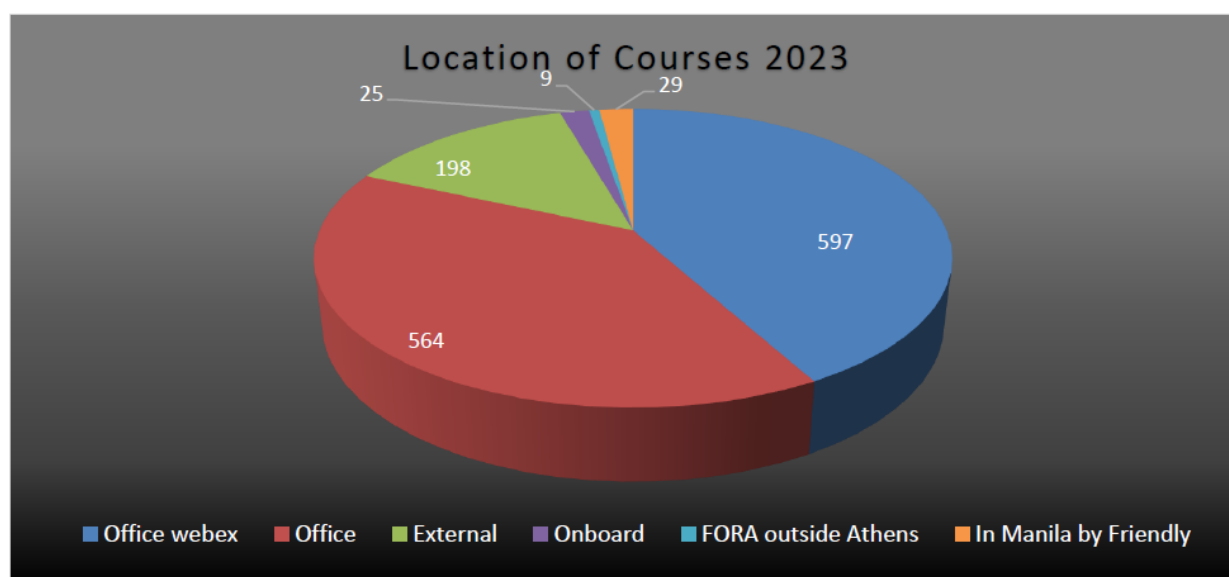
Source: DELPHIC MTC Annual Report 2023

It is essential to highlight that for 3626 (15419-11793) attendances of some in-house courses DMTC did not issue a certificate because certificates were issued by an external organization (e.g. DNVGL, ABS, PRIORITY, etc.) while for the external courses' certificates were issued by the training provider (e.g. KONGSBERG, MAN, NORSAFE, KORONAKIS, etc.). Participation in the company's forums or workshops does not necessary include a certification issuance as a requirement.

Following figure (1) illustrates the number of courses and participations, including external ones on 2022 & 2023. The percentage of remote trainings was reduced compared to 2022, together with an increase in external trainings. (DELPHIC MTC Annual Report 2023).

Figure 1: Number of attendances & courses (internal & external) 2022-2023

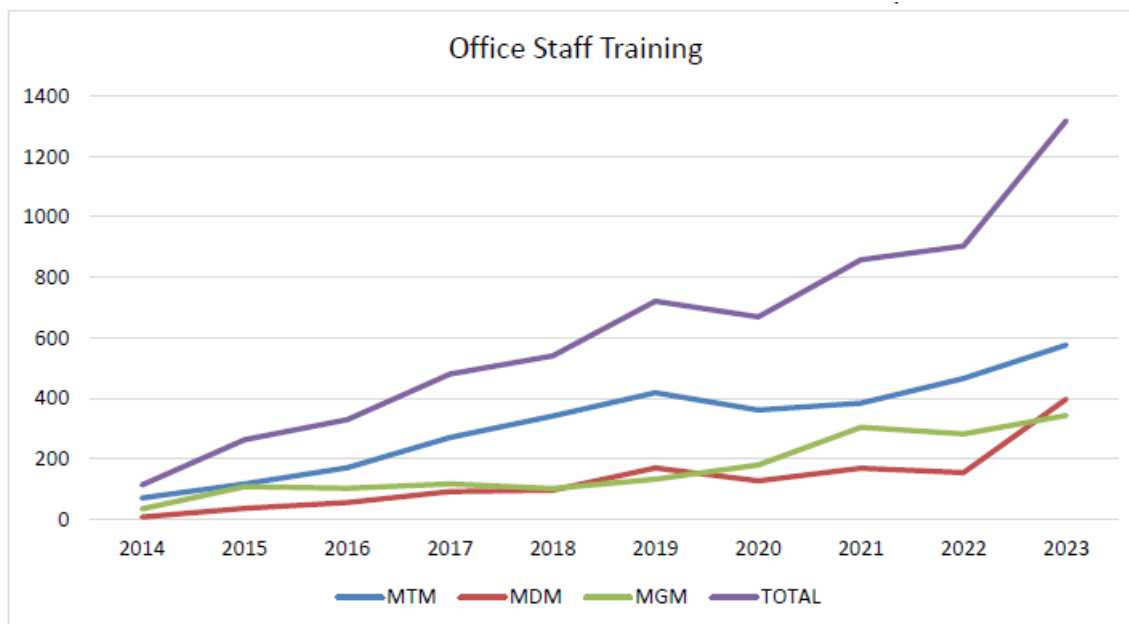
Location	2022	2023
Office webex (inhouse via webex and cloud)	424 (46%)	597 (42%)
Office (inhouse with actual attendance)	334 (37%)	564 (40%)
External (by external providers)	139 (15%)	198 (14%)
Onboard	21 (2%)	25 (2%)
FORA outside Athens	6	9
In Manila by Friendly	-	29 (2%)
Total	924 (100%)	1422 (100%)



Source: DELPHIC MTC Annual Report 2023

The following figure (2) shows the attendances of office staff to the courses over the last years (DELPHIC MTC Annual Report 2023).

Figure 2: Number of attendances & courses for office staff 2014-2023



There was an increase 46% in the number of participants compared to 2022.

Source: DELPHIC MTC Annual Report 2023

In view of the future technological developments and increased training needs, the capacity of DELPHIC must be assessed on a regular basis. Purpose is to ensure that training needs of ASGL can be accommodated to the highest standard.

It is concluded that, based on current set up and fleet vessels, DELPHIC can serve the 3 fleets. Inhouse facilities are adequate for now, and additional instructors can be employed, if needed. External facilities are used under controlled conditions, if needed, for specific needs.

CAPACITY OF DELPHIC

INHOUSE

	2021	2022	2023
Simulator activities			
Number of courses delivered	306	330	449
Participations	1498	1809	2517

The increase in number of courses and participations was dealt with in a satisfactory way, with the use of the new equipment, the cloud options and use of additional instructors.

SIMULATOR NEEDS - CAPACITY

This analysis and estimation of DELPHIC capacity is based on:

- the current set up of the simulators equipment and instructors,
- the requirement for basic, advanced and refresher simulator courses every 5y,
- steady flow of officers, new comers to the group up to +20%,
- assumption that every instructor can deliver 43 weekly courses per year,
- fleet of 145 vessels

It refers to a system in balance, so it is rather indicative than dynamic.

2 Bridge simulators with 3 instructors, need for 5 days course every 5y

- $145 \text{ vessels} \times 10 \text{ officers per vessel} = 1450 \text{ officers} + 20\% = 1740 \text{ every } 5y$
- $1740 / 5 = 348 \text{ deck officers per year}$
- $348 / 6 \text{ (capacity of course)} = 58 \text{ courses per year} \Rightarrow 1.4 \text{ instructors.}$
- Other 1.6 instructors cover ECDIS, BTM-BRM with simulator, BTM BRM theory and other courses.

Facilities are sufficient, more afternoon courses can run with one more instructor if needed.

2 Engine simulators (+ cloud) with 2 instructors, need for 5 or 3 days (refresher) course every 5y

- $145 \text{ vessels} \times 10 \text{ engineers per vessel} = 1450 \text{ engineers} + 20\% = 1740 \text{ every } 5y$
- $1740 / 5 \text{ years} = 348 \text{ engineers per year}$
- $348 / 6 \text{ (capacity of course)} = 58 \text{ courses per year} \Rightarrow 1.4 \text{ instructors (for 5d course).}$

Facilities (incl cloud option) and instructors sufficient for now.

1 Tankers cargo simulator (+ cloud), 1 instructor (part time), need for 5 or 3 days (refresher) course every 5y

- $46 \text{ MTM vessels} \times 10 \text{ deck officers per vessel} = 460 \text{ officers} + 20\% = 552 \text{ every } 5y$
- $552 / 5 \text{ years} = 110 \text{ per year}$
- $110 / 6 \text{ (capacity of course)} = 19 \text{ courses per year.}$

Facilities (incl cloud option) and instructor sufficient for now.

1 LNG cargo simulator via cloud, 1 instructor (part time), need for 5 or 3 days (refresher) course every 5y

- 45 MGM vessels x 10 deck officers per vessel = 450 officers + 20% = 540 every 5y
- 540 / 5 years = 108 per year
- 108 / 6 (capacity of course) = 18 courses per year.

Facilities (incl cloud option) and instructor sufficient for now.

CHALLENGES TODAY

System is not in balance yet. There is a big need for refresher courses, which is a new requirement. This will continue in 2024 as well.

TRAINING CAPACITY IN MANILA

Type of course	Course	Provider	Frequency	Needs
Inhouse by FRIENDLY	e-sms familiarization	FMS	app. 2/month	Satisfactory till now
In-house by external provider	Mental Health – Speak up confidently	Green Jacobsen	app. 2/month	Satisfactory till now, we can increase number of courses or providers if needed
External courses	Crane operator	approved local provider	app. 1/month	Satisfactory till now, we can increase our courses or use local providers if needed
	Bridge simulator courses	approved local providers	when needed	
Remote courses by DELPHIC	Cargo simulators	DELPHIC	app. 1/month each course	Satisfactory till now, we can increase our courses or use local providers if needed
	Engine simulator senior			
	Cyber security officer			
	Safety Officer			
	KAPA PMS			
	Scrubbers – Ballast systems			
	PSC - vetting			
	COLREG			
	SIGTTO			
	Hatch covers			
	ECDIS refresher			

	Resilience			
New inhouse courses by FRIENDLY	SIRE 2	FRIENDLY can run this course together with the e-sms, from Jan 2024		
	Passage plan	Under development		

Source: DELPHIC MTC Annual Report 2023

To conclude the glimpse on the numbers of the training center, DMTC increases every year the courses in an attempt to enrich its curriculum with new classes. These additional training and seminars cover not only every company's needs but also venture to follow and embody new trends in maritime education that fit and fulfill the group's strategic training plan.

On the other hand, Group expansion leads to an increase in participants every year and fundamentally increases the operating needs of the training center together with the need for quality of education. For this reason, the training department every year not only keeps the existing quality standards of tutorship but develops and adds new technological tools and instruments in order to achieve the highest performance numbers. A unique example constitutes the upgrade of the simulator courses and the increase of simulator rooms.

As a result of the continuous demand of competent seafarers with the proper certification and education, DMTC is led into a new era that the COVID-19 restriction further accelerated, to use widely and more often the distance learning.

However, the training department has to ensure not only to adapt to the new circumstances, but to also satisfy the group's expectations; one of DMTC top priorities is to discover and adopt the quality standards that fit and fulfill the maritime industry and the Groups' expectations for example by including min two SIRE 2 questions in every simulator course. This was mentioned in the Annual Report 2023 as a goal for 2024.

3.4. Policy on online training and actual relevant processes

DELPHIC MTC in an effort to facilitate the members of the Group, has been employing a variety of new technological tools from 2019 onwards, working more with video calling meeting options and expanding the use of these tools in training as well. In fact, this has been an objective of the Group both for 2019 and 2020 in an effort to cover the training needs of the seafarers residing far from the Group facilities. However, due to the coronavirus travel restrictions, the group had to adapt faster and develop flexible training solutions. The fact that technological developments have already created an environment capable of remote real-time live classrooms contributed positively in that direction.

The usage of modern platforms (WebEx¹, Zoom²) which offer high-quality communication and interaction during the courses constitutes under these circumstances an efficient solution close enough to the actual classroom courses that are being carried out in the Group facilities. Also, these practices have already been employed in the past by many reputable training providers, including universities, where have experienced and offering real-time or distance learning many years ago. In addition, DMTC has already used Seagull³ and Videotel⁴ platforms to provide asynchronous distance learning on board for seafarers (officers and crew) while for the office staff SQ LEARN⁵ platform is used for the same purpose. Taking into account that there are no international standards applicable to real-time virtual classrooms, DMTC developed a procedure to ensure that training is provided under controlled conditions with equivalent results to regular in class courses. The following procedure was developed for DMTC courses when provided via a live virtual classroom: Firstly, the instructor who delivers the actual course in-house always fulfills the DMTC requirements. DMTC internal instructors are office staff with great experience to the topic that is called to instruct while at the same time, their commitment to the Group's values, policies, and culture contribute to the effectiveness of the courses. Besides, for the choice of external instructors, the Group occurs a thorough evaluation of the market base on their expertise, reputation, and experience, and most of them are makers, experts, service providers, or Class, with long term experience and presentation to the maritime industry. Secondly, if the training material is developed and used for the live classroom it has to be modified accordingly to fit and facilitate the live virtual

course. Thirdly, platforms as Skype⁶ or WebEx or similar have to be used where video, voice, and chat options are allowed. Last, DMTC defines the max number of participants to 15 persons per course while the total duration of the course doesn't exceed the five hours with breaks every hour. The registration of participants is completed by the crew departments, depending on their training needs. However, DMTC has the responsibility to send to all participants an invitation in advance, the training material and joining instructions while a copy of the invitation will be saved by DMTC as evidence of the procedure. ID code is given to all the participants to register in the system in order to ensure the proper identification of them.

Prior the commencement of the virtual course, a test of equipment is carried out and when the course starts the instructor checks the list of participants and verifies the attendance. Evidence of the participants will be kept in the form of photo, recording, auto-generated list of participants, chats, etc and the final list of participants will be signed by the instructor. In an attempt to review and improve the procedure, DMTC instructors ask (orally) the participants a first feedback regarding the course and the technology involved in an effort to check whether the participants faced any problem or issue with the equipment or technology related in general. Moreover, for feedback purposes and as an evaluation tool the center uses polling. Every course is evaluated by the participants, either with the use of a hard form or a bar code in the actual classrooms or with the use of a polling tool for the remote courses. In 2022 DELPHIC MTC introduced an additional method of evaluation via telephone interviews, on top of the standard one.

The KPI was to contact 3% of the participants, managed to contact 985 participants, almost 6.5%. During the interview participants feel more open and relaxed to discuss. Although the overall conclusion is that they are satisfied with the training, some interesting specific points were raised, which will be taken into account in the 2024 courses. Records of interviews are anonymous. Results are saved by DMTC while any recommendations for improvement are always discussed with the training manager. In case a test is required for the specific course, it is scheduled through the Seagull platform or by emails and the records must be kept in DMTC. The issuance of Certificates is carried out as usual, in line with DMTC procedures, regarding the live virtual classroom.

¹<https://www.webex.com/>

²<https://zoom.us/>

³<https://www.seagull.no/>

⁴<https://videotel.com/>

⁵<https://www.sqllearn.gr/>

⁶<https://www.skype.com/el/>

3.5 Advantages of in-house Training

The in-house training center constitutes an advantage for the Group. It is a voluntary and non-profit activity that shows management commitment while ensuring the high-quality of the training. Apart from covering the Group training needs, the expected long-term results are targeted. The courses provided are designed to address specific training requirements as well as the Company's policies and practices referred.

Additionally, it enforces its employer branding as it reflects the commitment of the Company and its management towards its employees and seafarers. The fact that it is free to all participants encourages the active participation of seafarers while any proposals or feedback are considered as an opportunity to develop the operation of the training center. More importantly, it enhances the contact between the office and sea personnel and empowers team building as persons from different departments and skills sets can foster teamwork, recognition and understanding of each other's roles. From the financial perspective, the operation of in-house training center is a more cost-efficient option because the cost per person for the in-house training courses is less compared to the trainings in external training centers.

The Group has the ability to customize training as this allows addressing and covering the specific business needs and learning objectives of the Group clients. This is an important advantage as it allows a tailor-made curriculum to the specific needs of the Group, using real industry examples or incidents.

Concluding, an important advantage for the in-house training services is the control of quality that the training facilities offer and the ability to control the schedule of training mainly for sea personnel during the vacation period i.e. when they disembark from the vessel.

Also, the operation of an in-house training center permits a holistic approach towards the training and development of the human capital and is a place where the culture of a company can directly be visible and distinguished. Operating an in-house training center allows the company to promote and train the personnel on items important for the Company; in the case of a shipping company safety culture can be a key message through all the courses delivered.

4. Objectives – goals of the study

4.1. Goals of the study

The goal of this study is to identify the criteria for evaluation of quality standards of online and distance learning methods applied in the maritime industry, to conclude on the evaluation tools for online and distance learning and to identify the current trends in the maritime training focusing on online training addressed to seafarers so as to provide to the Group a concrete study and a high quality and valuable deliverable on the topic. It also, aims at assisting

Angelicoussis Group in evaluating the quality of the online and distance training the company has been developing and experiencing the last few years as well as identifying ways for Delphic MTC to improve the virtual classrooms, both in terms of framework as well as applicable quality standards and in day-to-day operations and practices.

Moreover, the goal is to provide a solution-driven result, to help the Group create value through the execution of a highly professional project that will be specific and of practical use to the Group and to recommend realistic and tailored made solutions that will be able to be used as a decision-making tool, always responding to the expectations of the company, providing results, benefits that will be able to be used as a practical guide.

4.2 Methodology followed

The project topic was identified after a relevant discussion with the Angelicoussis Group representative, where serious interest was demonstrated on Human Resources topics and the Group's representative identified the online training of the seafarers as an area of interest and a need for further analysis. The project began with an analysis of its context and main goals and objectives. As a next step a clear work plan has been developed and agreed between the team, the instructor and the Group. The topic analysis combined a desk research, a literature review and a review of the academic research in the field.

The project required a thorough desktop research of the existing literature as well as identification of the scientific fields in focus, as well as comparative analysis and a focus on the maritime context. The methodology required the collection of secondary data. For the collection of data, desktop research was followed which included: (a) review of the Groups' policies and practices, (b) literature review of scientific papers in the fields of distance and e-learning quality standards and maritime training and development, (c) maritime industry papers and reports on the topic.

At first, the group's vision, mission, business strategy and corporate culture were reviewed, in order to examine how these are reflected to the training policy of the group. Also, the current Group's training policy was thoroughly analyzed and evaluated so as to be able to identify the status quo and proceed to gap analysis and proposals for improvements.

The topic analysis combined desk research, a literature review and a review of the academic research in the field. A literature review was thoroughly performed by surveying the published academic and non-academic works. The key terms of 'e-learning', 'quality standards', 'distance learning', 'online training', 'maritime training', 'training standards' have been used in the research. The identified scientific fields in focus are:

- Quality Standards in distance learning
- Maritime Education and Training

Apart from the literature review, some main sources that were used are the Training Center's manuals and relevant material from training department and the working guidelines developed inhouse as well as the Groups' websites. Also, a thorough search of the pertinent international standards for training providers issued by classification societies, flags and other industry players has taken place.

4.3 Company Involvement

The Group, through its representative – the training manager of the Group- demonstrated commitment in assisting to achieve its deliverables. The Group clearly defined the desired objective and need to be addressed, developed a clear proposal for the study, meaning the need to develop a thorough research and analysis on the online training and methods for the training and development of the seafarers. The company representative has been involved in several rounds of work review and has provided guidance and advice. Necessary information from inside the group was provided. Training circulars and manuals were shared in order to be able to understand the Group's training policies, processes and methods followed, and in general depict the Group's current status on the topic. Project objectives and deliverables were agreed so as to ensure the proper academic focus and scope of the project.

5. Review of distance learning and online training concepts

5.1 Distance learning and online training

One simple but concrete definition of e-learning is the one used by Clark and Mayer in 2016 by which E-learning is defined as “instruction delivered on a digital device such as a computer or mobile device that is intended to support learning”.

E-Learning courses include both content and instructional methods that help people learn the content. They are delivered via digital devices using words in the form of spoken or printed text and multimedia such as illustrations, photos, animation, or video.

E-Learning lessons are intended to help learners reach personal learning objectives or perform their jobs in ways that improve the bottom-line goals of the organization. The goal of e-learning is to build job transfer-able knowledge and skills linked to organizational performance or to help individuals achieve personal learning goals.

Asynchronous learning is when an e-learner can log in and learn at any time and any place, and can use e-mail, discussion boards, message boards or chat rooms to ask questions about the course (Ki Yin et al.,2019). Synchronous on the other hand means that things are happening at the same time (Vai, Sosulski, 2011). Synchronous learning is an instructor-led learning in a virtual classroom setting. During this kind of event, learners log on at the same time and an instructor guides the class. Blended learning is the using of connected mobile tools such as smartphones, tablets, and laptops, and we purposefully “blend” physical and online activities to create optimal experiences. So, blended education situates learning experiences online or onsite based on the relative strengths and weaknesses of each mode (Stein, Graham, 2014).

As listed in a report of European Association for Quality Assurance in Higher Education the e-learning methods are:

Distance education courses

Distance education courses are those where no classes are held on campus – all instruction is conducted at a distance. Distance education courses may use a variety of delivery methods, such as video/audio conferencing and those which are internet- or print-based.

Online courses

A form of distance education where the primary delivery mechanism is the internet. These could be delivered synchronously or asynchronously. All instruction is conducted at a distance.

Synchronous online courses

Courses where students and an instructor participate at the same time, but at separate locations other than an institutional campus. These courses may be delivered by video conferencing, web conferencing, audio conferencing, etc.

Asynchronous courses

Courses where students are not required to participate in sessions at the same time as the instructor. These may be print-based courses or online courses using a learning management system, for instance.

Online programs

A fully creditable program that can be completed entirely by taking online courses, without the need for any on-campus classes. These could be delivered synchronously or asynchronously.

Blended/hybrid courses

These are courses designed to combine both online and face-to-face teaching in any combination.

OER (open educational resources)

Materials that are offered freely for use by teachers and learners, i.e. without charge and with few or no restrictions on the way in which the material may be adapted and reused.

MOOCS (massive open online courses).

Online courses that are designed for large numbers of participants, often offered for free and without any entry qualifications. They are distinguished from OERs in that they offer a full course experience and content that is not usually free to reuse.

Table 3: Synchronous, asynchronous & blended learning (definition, platforms, pros & cons)

	Synchronous Learning	Asynchronous Learning	Blended Learning
Definition	Is any type of learning that takes place in real-time, where a group of people are engaging in learning simultaneously (Finkelstein,2006)	It enables learners to complete courses without the constraints of having to be in a certain place at a certain time, as long as they access to the internet (Vai & Sosulki , 2011)	It's a course that may include, on-the-job project, asynchronous online pre work assignments, an in-person classroom session by virtual classroom discussions (Clark & Mayer, 2016)
Platform Used (examples)	Zoom, Skype, WebEx	YouTube, Blackboard, Google Drive	Most often used by universities and companies for training purposes.
Advantages	Learners can easily interact which Instructors and other learners, making group activities possible Learners can immediately feedback. Ideas and opinions can also be promptly share with fellow learners	Asynchronous Learning offers lots of flexibility It's a cost-effective way to train learners that are based in varying locations.	Students have access to helpful online material anywhere and at any time Blended learning provides more interactive educational experience
Disadvantages	Learners can't access content where and when they like Learners may feel they are not receiving the individual attention they need	Answers to questions cannot be given instantly The lack of interaction with instructors and fellow learners leaves some individual feeling isolated	Students can experience cognitive load too Basic technology knowledge

5.2 Maritime distance learning

The maritime industry is constantly changing. It is a business that grew up with the world economy, exploring and exploiting the ebb and flow of trade. Today it has become a global business community, built on communications (Stopford, 2009).

The regulatory framework requires for the seafarer occupation to have at all times mandatory training and renewed certificates (STCW). Training, apart from a mandatory requirement, can consist of a non-monetary incentive for the seafarers as it is linked to the development of the seafarers and their career plan, to the updating of their skills and knowledge ensuring the improvement of the seafarers performance and his/her personal progress (Theotokas, 2018).

At the same time, contemporary issues in the HR science and especially for the training have arisen and throughout the literature IT tools can play an important role in the delivery of training (Moore & Diehl, 2019)

Researchers and academics have underlined that companies and seafarers can use e-learning so as to meet training needs and requirements (Sandell, 2015; Ki Yin et al., 2019; Hu et al., 2013; Momoko et al., 2015). The e-learning generic umbrella provides different tools that can be used in the maritime industry for training purposes.

Research shows that the criteria and quality standards for online training can play an important role as they directly affect the performance of the training and the satisfaction of the user (Hu et al, 2013; Moore, 2019; Grigoraş et al, 2014).

Quality standards for online training and distance learning of seafarers have not been explicitly listed, however, throughout the literature, many researchers and academics have touched the issue of quality for e-learning. Even if learners' criteria for quality in their e-Learning experiences are generally not well understood (Frydenberg, 2002), there have been quality approaches by institutes and Universities (Azusa Pacific), EU funded programs efforts (Criteria in Evaluating Quality in E-Learning, 2006) and individual academics and scholars. Criteria identified deal with both the technical features of the course, for example flexibility and usability of the system (Grigoraş et al, 2014; Hieu et al, 2015; Hu et al, 2013; Stein, Graham, 2014) and data security (Ibid; Frydenberg, 2002) as well as criteria having a more high-level view like top management commitment (Armstrong, 2006) and using seafarer's (learner) experience for example and application (Ibid; Sandell, 2015). However, there is still nothing uniform and universally accepted in the maritime industry.

6. Quality standards and factors affecting the effectiveness of online training and distance learning

6.1 Description of training cycle and process of training needs identification

In order to design and deliver a successful training session, not only an online, as these characteristics apply to training in general, a thorough understanding of training and development issues must be created. The link of the training scope to the seafarer's job must be clear. The specific training challenges must be addressed in advance. The employment of diverse learning styles will definitely add value and increase the possibilities of the seafarers to adapt and effectively follow the training. In order to reach to a high-quality training session, both online and live, a training needs analysis must be conducted. Depending on the content of the training, its main steps and objectives have to be clearly defined in order to reach to an effective training design. Upon the implementation of the training, the evaluation of training is an indispensable part which will add value to the whole process and will lead to more efficient and successful future sessions.

As a first step it is the definition of the learning required that needs to take place. Then, the objectives of the training must be defined. Following the setting of the objectives the training program is planned, deciding also who will conduct the training. Upon the implementation of the training the evaluation of the training must follow so as to modify accordingly the training program based on the evaluation.

An analysis of competences needed for the seafarers (Captain, Chief Officer, Chief Engineer, Other) job has to take place as well as an analysis of the company's specific organizational needs (there might be a new system to be installed on the vessel, there might be the need to train the sea personnel on company's culture and values for alignment purposes). Moreover, in order to clarify the needs of a specific role or a specific role holder the assessment of individual's performance over time has to be conducted. In this process, feedback is necessary (crew performance evaluation) as well as observation of the seafarer while performing the job.

It is of paramount importance to underline that the process of both training needs identification and training design must include and involve the relevant stakeholders; meaning, of course, the seafarers. This way it can be ensured a variety of important contributions in terms of skills which are deriving from their proper human factor experiences as well as professional expertise. By having the seafarer directly explaining to the training designers the way users are working, thinking and interacting, the designer receives valuable input about how to build the training based on reality-based representations, make it respond to the users' needs based on their abilities and experiences and make it truly useful for the users.

6.2 Online training specific

The technological connectivity has transformed the way that people live and interact. Geography is no longer the primary constraint on organizations. E-HRM have entered the companies including even the use of social media. Basic HR functions have adopted the use of technologies in the day to day operations, for example recruitment. Training and development and general learning is an HR function that has seen important effect and contribution of the technological connectivity.

As it has been successfully pointed out by Praetorius et al. (2015), “today’s merchant vessels can be considered as complex socio-technical systems. The notion of a socio-technical system emphasizes the importance of recognizing the interrelationships between humans and technology in a social context in which work occurs.” In today’s maritime environment, mariners interact with complex technology as part of their day to day work. In such a context, the use of new technologies has created a new educational framework and especially in the marine education we see new broad ways being opened to the learning and tutoring sectors. Maritime Education and Training can effectively make use of the modern technologies, namely the offered E-learning tools so as to promote knowledge management best practices for the seafarers.

The training can be a formal program involving lectures and videos, role-playing and cases. Simulations exercises are also supported by technology as well as videoconferencing. Computer based training is a well-developed area in the shipping industry today.

Furthermore, if we take into account the shortage of qualified teachers in the maritime training industry (Chen et al, 2017) and the relatively high cost of maritime training globally, we will easily realize that e-learning can offer to the companies the opportunity of employing highly experienced instructors so as to provide tailor-made and high quality trainings, delivering them online and minimizing this way the costs. So, e-learning can enable the companies to employ the most specialized instructors depending on the topic of the course, addressing this way both the shortage of specialized teachers in the region where the company operates and the enormous training budgets.

In order to achieve a successful training which is designed to be conducted through these new technologies, it has to be clear to the seafarers why they are learning something. The best scenario is to bring more work-related experiences into the learning situation in order to use the seafarers experience as basis for examples and applications. Also, to enter into the learning experience with a problem-centered approach, including in the training an immediate application of the content if possible.

Today, the technology offers us various types of learning methods such as multimedia lessons, quizzes, videos and virtual rooms.

It is expected that the use of new technologies for training delivery to the seafarers will further increase – the example of the COVID-19 can be mentioned here but the tendency to further adopt online training was already here. Digitalization had already an important role in the shipping industry and online training had already been established way before the COVID-19 lockdown.

Therefore, the demand for training for virtual work arrangements will rise. So, emphasis on storage and use of intellectual capital will rise as well. Training departments will become “virtual training organizations.”

6.3 An overview of quality criteria and quality standards of e-learning

The maritime industry places a very important role on Maritime education and training as these undertake an important mission of cultivating personnel to operate and manage the vessels. The importance of the training courses addressed to seafarers can be understood if we realize that these directly deal with fundamental aspects of the operations of the vessels such as its navigation. Despite the importance placed on training for the maritime industry and its personnel, explicit quality standards have not been set by the Industry. Also, an evaluation system for the E-learning use in the maritime industry has not been established up to this point.

In an effort to identify quality criteria used for the e-learning in the maritime training, the team contacted DNV GL Maritime Academy in Greece for relevant feedback on quality criteria for e-learning and the fact that no standards exist was verified. According to their feedback regarding their exposure to the online training services together with the WMU offering Postgraduate Diplomas, the Academy is particularly concerned about the security and the quality of the training platform. After having assessed many training platforms the Academy decided on the one that fulfils its security and quality requirements. They also underlined the importance of the training of the Academy's trainers so that they perform in the best possible way taking into account the restrictions of interaction of online training as opposed to face to face training and how this can be overcome in order to keep the participation interesting. On a last note, DNV GL Maritime Academy develops the training material in such a way so as to fit the purpose of online training without compromising quality and content. They make sure they engage participants into groupwork and assess the courses using online tests.

As underlined by Slimp (2014), perceptions of quality in online learning are as complex as the various models and delivery methods available.

In their paper "Global standards for enhancing quality in online learning", Martin et al.(2017) gather different approaches and assumptions regarding the evaluation of quality in online learning.

Inter alia:

- That quality in an online education program is not its growth rate but the combination of retention rate, academic outcomes, and success in online student and faculty support (Shelton and Saltsman, 2004)
- That a strong need exists for a common method for assessing the quality of online education programs
- That higher education institutions link the assessment of the programs with standards based on institutional commitment, support, and leadership. (Ibid)
- Elements essential for quality online training are the course development, teaching, the course structure, student support, faculty support, technology, evaluation, student assessment and examination security, adding that the most essential requirement is institutional vision, commitment, leadership, and sound planning. (Daniel and Uvalic-Trumbic 2013)
- That a frequent structure that organizations use as quality standards models include aspects of institutional management, curriculum design, student support, and other elements of educational provision (Ossiannilsson, et al.2015)
- That it might be difficult for educators to understand and apply technical quality frameworks while choosing an e-learning system (Bari and Djouab 2014)
- Frydenberg's standards domains; institution commitment, technological infrastructure, student services, design and development, instruction and instructor services, program delivery, financial health, legal and regulatory requirements, and program evaluation. (2002)

Suggested steps in building the e-learning environment (Grigoraşa, Dănciulescu, Sitnikov, 2014):

- Establishing standards on quality assurance and control, process and output indicators
- Build an internal quality control system on project outcomes
- Pilot testing with user's involvement and assessment
- Analyze feedback information to create the final form of the e-platform
- Develop questionnaires for target group regarding the training modules and e-learning platform features

They also suggest a Course description to show to the trainee information about the general presentation of the course such as a description, targets, topic list, help desk contacts, staff involved, and learning tools. Also, the availability of an agenda will allow teachers, tutors or course managers to insert important course deadlines together with a title of the event or activity to be carried out, a description of the event or activity to be carried out. Moreover, the availability of a Library will provide a mechanism for organizing files and links that the instructor can choose to make available to trainees.

In the report "Utilizing E-Learning tools to foster knowledge management practices in Maritime Education and Training", Hieu, Bolmsten and Kitada discuss that the knowledge management system has to include the below elements:

- **Supporting of Knowledge Detection, Sensing and discovery, organization:** Searching for existing knowledge. If knowledge exists within the organization, it must be properly recognized, externalized and categorized before it can be reused or shared within a system. With explicit knowledge, IT based systems can be used to search for knowledge by looking at the database, patterns and text.
- **Facilitating collaboration, socialization and communication:** Dealing with tacit knowledge is a lot more complex. It is perceived to include cultural beliefs, values, attitudes, mental models as well as skills, capabilities and expertise. knowledge management processes that are related to tacit knowledge requires socialization, collaboration, communication, and such activities can take place under many different forms.
- **Enabling participants to create, distribute, share and reuse the knowledge easily:** Once the new knowledge has been detected or created, there should be an effective tool to store, organize, share, retrieve and reuse it. The user friendliness and the experience of the interaction with a system plays an important role to encourage users to participate in knowledge management processes.

In the paper "Effectiveness of web-based training compliance with seafarers international training convention", Ki-Yin et al. 2019 suggest that any distance learning and e-learning program:

- Is provided by an entity (e.g. Classification society) that is approved by the educational institute
- Is suitable for the selected objectives and training tasks to meet the competence level for the subject covered
- Has clear and unambiguous instructions for the trainees to understand how the program operates
- Provides learning outcomes that meet all the requirements to provide the underpinning knowledge and proficiency of the subject
- Is structured in a way that enables the trainee to systematically reflect on what has been learnt through both self-assessment and tutor-marked assignments
- Provides professional tutorial support through telephone, facsimile or e-mail communications

Focusing on quality standards, Brosseau and Vrabie (2015) suggest the below requirements, inter alia, as quality essential characteristics for the implementation of E-learning in SMEs:

- integrability: E-learning must be easily integrated into the process of working and can be accessed there
- a brief form: The work processes must not be interrupted too long (this would apply for on-board trainings for the maritime case)
- information of the workplace: Specific references to the workplace and work processes must be met
- transferability: The acquired knowledge must be directly implemented in the work practice and must be applicable, as often as possible
- flexibility: Didactic design and technical content must comply with the requirements and must be adaptable in the company
- industry-specific: The provision of industry-specific content and guides facilitate the application

Focusing on the learner, Armstrong (2006) identifies below pedagogic principles linked to the quality of content of the e-learning:

- learners must be stimulated by the learning process
- the program and content should be seen to be intrinsically relevant, the method of presentation should be interesting, use should be made of graphics, animations, audio, interactive simulations, scenarios, case studies, projects, question and answer sessions and problem-solving activities where appropriate – the program should not simply involve ‘page turning’
- learners must be encouraged to respond to stimuli and should be engaged in the learning process
- learners should understand their learning goals, preferably working them out for themselves but with help where necessary
- the program should be constructed in incremental steps and presented in ‘bite sized chunks’ or modules, each with clear objectives and outcomes
- learners should be able to plan their learning (self-paced learning)
- learners must be able to measure their own progress but should be given feedback as well
- learners should be encouraged to reflect on what they are learning by reference to their own experience

6.4 Factors affecting the effectiveness of online training and distance learning

Numerous standards exist, and the effectiveness of each can vary. The purpose here is to identify common trends across the research in order to provide evidence of principles that can contribute to a quality e-learning course. The below factors constitute some of the most common throughout the literature as the majority of authors concentrate their analysis on them when it comes to quality aspects of e-learning:

Table 4: Factors affecting the effectiveness of online training and distance learning

Factors	Source Book or Journal	Author	Year	Blend	Asynchronous	Synchronous
Academic Sources						
1.Course Structure / Design						
	Journal	Frydenberg J.	2002		x	x
	Journal	Elias T.	2010			x
	Journal	Ajmera,R.Dharamdasani,D .	2014	x	x	x
	Book	Simonson,M.,Smaldino, S. Albright, M, Zvacek	2014	x	x	x
	Document	EOCCS	2024			x
2.Evaluation and Assessment						
	Journal	Jia Frydenberg	2002		x	x
	Book	Martinez, R., Liu, S., Watson, W., & Bichelmeyer, B.	2006			x
	Book	Yarbrough, D. B., Shulha, L. M., Hopson, R. K., & Caruthers, F. A.	2011	x	x	x
	Journal	Pallof, R. M. & Pratt, K.	2011	x	x	x
	Book	Simonson,M.,Smaldino, S. Albright, M, Zvacek	2014	x	x	x
	Journal	Ajmera,R.Dharamdasani,D .	2014	x	x	x
	Document	NSQ	2019	x	x	x
	Document	EOCCS	2024			x
3.Course Instructor / Trainer						
	Journal	Zirkin, Barbara G.& Sumler, David E.	1995		x	x
	Book	Herring, M., & Smaldino, S.	2001	x	x	x
	Journal	Miller, C.	2007			x
	Journal	Ajmera,R.Dharamdasani,D .	2014			x
	Book	Smaldino, S. E., Lowther, D. L., Mims, C., & Russell, J. D.	2015	x		x
	Document	NSQ	2019	x		x
4.Programme Duration						
	Journal	Logan, R., & Geltner, P.	2000			x
	Journal	Crowe, A., Hyun, E., & Ketrovics, M.	2005	x	x	x
	Journal	Austin, A. M., & Gustafson, L.	2006			x
	Book	Kucsera, J. V., & Zimmaro, M.	2010			x
	Book	Tatum, B. C.	2010	x	x	x

	Journal	Simonson, M., Schlosser, C. & Orellana, A	2011		x	x
	Journal	Collins, A., Hay, I., & Heiner, I.	2013			x
	Journal	Harlow, J. J., Harrisona, D. M., & Honig, E.	2013			x
	Journal	Adams, G. L.	2013	x	x	x
5.Number of Students						
	Book	Sieber, J.	2005			x
	Journal	Tomei, J.	2006			x
	Journal	Burruss, N. M., Billings, D. M. Brownrigg, V., Skiba, D. J., & Connors, H. R.	2009			x
	Journal	Taft, S. H., Perkowski, T., & Martin, L. S.	2011			x
	Journal	Sorenson, C.	2015			x
	Journal	Parks-Stamm, E. J., Zafonte, M. and Palenque, S. M.	2017			x
	Journal	Lowenthal, R., Nyland, R., Jung. E., Dunlap, J. C. & Kepka J	2019			x
6.Strategic Planning						
	Book	Saba, F.	1999	x	x	x
	Book	Watkins, R., & Corry, M.	2002	x	x	x
	Book	Watkins, R.,& Kaufman, R.	2002	x	x	x
	Journal	Simonson, M., Schlosser, C., & Orellana, A.	2011	x	x	x
	Journal	Ossiannilsson E, Williams K, Camilleri A & Brown M	2015	x	x	x
7.Learners Satisfaction						
	Journal	Quiyou, H., Nikitakos, N.V., & Papachristos, P.	2014	x	x	x
8.Training Duration						
	Journal	Latham, G. P., & Locke, E. A.	1975	x	x	x
	Book	King, P. E.	2008	x	x	x
9.Technology Quality Support						
	Book	Clark, D., & Frith, K	2013	x	x	x
	Book	Nsiah, G. K. B., & Oti-	2015	x	x	x

		Boadi, M.				
	Journal	Al-Hunaiyyan, A., Al-Hajri, E., Alzayed, A., & Alraqqas, B.	2016	x	x	x
10. Institutional / Faculty Support						
	Book	Savery, J.	2005	x	x	x
	Journal	Wolf, P. D.	2006	x	x	x
	Journal	Jaschik, S.	2007	x	x	x
	Journal	El-Seoud, S. A., Seddiek, N., Taj-Eddin, I., Ghenghesh, P., Nosseir, A., & El-Khouly, M.	2014	x	x	x
	Document	ESG	2015	x	x	x
	Journal	Kumar, S., & Heathcock, K.	2016	x	x	x
11. Student Engagement / Motivation						
	Journal	Maybery, D., Reupert, A., Patrick, K., & Chittleborough, P.	2009	x	x	x
	Journal	Delialioğlu, Ö.	2012	x		
	Document	Canadian Government and Transport Canada services	2013		x	x
	Journal	Henrie, C. R., Halverson, L. R., & Graham, C. R.	2015			x
	Journal	Mitroussi, K. & Notteboom, T.	2015	x	x	x
	Journal	Wu, X., Liu, Y., Zhang, Y., & Ji, L.	2016	x	x	x
12. Interaction						
	Journal	Garrison, D. R., & Cleveland-Innes, M.	2005	x	x	x
	Journal	Wanstreet, C.	2006	x	x	x
	Journal	Anderson, T., & Kuskis	2007	x	x	x
	Journal	Moore, N.	2007	x	x	x
	Journal	Bernard, R. M., Abrami, P. C., Borokhovski, E., Wade, C. A., Tamim, R. M., Surkes, M. A., & Bethel, E. C.	2009	x	x	x
	Journal	Simonson, M., Schlosser, C., & Orellana, A	2011	x	x	x
	Journal	Kenyon, P.L	2012	x	x	

	Journal	Kuo, Y.-C., Walker, A. E., Schroder, K. E. E., & Belland, B. R.	2014	x		
	Journal	Nwankwo, A.A.	2015	x		x

Table's Color coding: Black: Literature referring to distance/e-learning

Blue: Literature referring to maritime distance/e-learning

1. Course Structure / Design

Course design is one of the most critical topics as quality standards are concerned. Many authors argue about how a course should be designed and what are the principles to achieve that. Frydenberg (2002) mentioning that despite the educational outcome objective, there must be an abstract thinking and critical reasoning.

Elias (2010) has established some universal principles to ensure proper design and simplification for the users. Furthermore, Ajmera & Dharamdasani (2014) are mentioning the importance of flexibility and adaptability in the course, and they propose to include diagrams and pictures so as the student to get all the appropriate resources that they require.

Moreover, Simonson, Smaldino, & Zvacek (2014) are pointing out the importance of aligned course design and standards. Finally, EOCCS (2024) recommends that explanations must be made concerning the overall learning design and rationale before the commencement of the courses. In this way, members will be more familiar and better prepared. Online learning requires more attention in designing compared to the face to face classroom. In distance learning, participants must be engaged in advance in a supported intended, structured and engaging journey. The course design criteria are a) Target groups b) Design for learning c) Design of course layout d) Design of course content e) Design of course delivery f) Applied Technology g) Qualification.

2. Evaluation and Assessment

Frydenberg (2002) refers to the programme evaluation as a meta-activity that embodies all the aspects of the e-learning experience. Also, Martinez, Liu, Watson, and Bichelmeyer(2006) are describing assessment as a tool to identify the strengths and weaknesses of the course. Moreover, assessment can highlight the pros and cons of the e-learning so as to improve the flaws. Yarbrough, Shulha, Hopson, and Caruthers, (2011) refer to the evaluation as a constant investigation of an ongoing distance learning activity.

Pallof and Pratt (2011) note the importance of evaluation and feedback for instructors participating in professional development programs. The feedback is vital “to motivate and enable faculty to know how well they are doing, and to engage them in continuous professional development”. It is also critical to “link the evaluation of teaching effectiveness to ongoing professional development needs. Maritime training schools may employ student course critiques and surveys as a means to obtain feedback about instructor performance and effectiveness in the classroom. There is a multitude of elements that impact student opinions and experiences; “simply asking students how well the instructor performed or whether the instructor was present and provided help with course activities does not provide an adequate evaluation”.

However, Simonson, Smaldino, and Zvacek, (2014) illustrates assessment as a process of measuring, documenting and interpreting behaviors that demonstrate course learning.

On the other hand, Ajmera & Dharamdasani, (2014) define it as a vital part of the course curriculum according to which learners must be assessed so that course quality can be judged. Moreover, they emphasize the importance of continuous assessment of students so that the distance learning course

evolves continuously. They conclude that assessment should be done consistently and not just towards the students but also from students to the instructors. Also, they provide examples of how this evaluation can be done (real-time situation problem and find a solution or using questionnaires). A similar point of view is this of NSQ (2019) that focuses more on the trainer side. Authors describe what the duties of the trainer are, in terms of assessment and what tool can be used to evaluate better. More extensively, they outline the validity and reliability of the instruments and procedures. Instructors can measure student progress through assessment, projects and assignments to see if the program meets the standards-based learning goals and evaluate learners understanding of how these assessment measure achievements of the learning objectives.

Additionally, EOCCS (2024) mentions how the institution can use the assessment methods and presents how the course's intended learning outcomes are achieved. The members attending the e-learning course should evaluate the program and the instructors. After the evaluation, data should be carefully examined, and program managers must correct any defects or errors that participants had pointed out. By doing this, all parties contribute to the quality assurance process.

3.Course Instructor / Trainer

Another critical factor that has a significant influence on the e-learning course is the course instructor. Zirkin and Sumler (1995) perform research on the effects of interactivity and learning. The analysis revealed that those students that took part in synchronous learning (instructor attends the lesson) had an increased understanding of the courses compared to the students who attended asynchronous courses (ex.CBT's) as evidenced by the test performance, grades and student satisfaction.

Herring and Smaldino (2001) present the importance of the teaching method and how this should be based on the characteristics of the instructors, students and content. At the same time, Miller (2007) and Smaldino et al. (2015) are pointing out the importance of synchronous e-learning and the value that an instructor adds to distance learning courses.

Ajmera & Dharamdasani, (2014), in their journal "E-Learning Quality Criteria and Aspects", give the following definition of what is an effective trainer. "An effective trainer is a person who is responsible for the success and failure of any course or training." Additionally, they describe some criteria that an instructor must possess in order to be capable to teach effectively, and those are: 1) Capabilities. The capabilities that are mentioned are the qualifications and the experience that the instructor has. 2) The instructor should be selected according to the needs of the students attending the course. 3) A trainer should be able to transmit his knowledge to his students and to be able to meet the needs of students. 4) Should continuously monitor the progress of the participants and if necessary, change his teaching method if he deems that participants performance is low. 5) Moreover, the instructor is responsible for interactively delivering his course to avoid monotony and fatigue during the session.

In the National Standards for Quality online teaching in 2019 (NSQ,2019), we can see in more details the benefits that an instructor adds to the distance learning. Some of these are that 1) The online teacher employs learner-centered instructional strategies and current practices that leverage technology for learner collaboration. 2) The online teacher creates expectations for appropriate interaction among learners, including establishing netiquette requirements, modelling implementation, and enforcing the conditions. 3) The online teacher develops a community among culturally diverse learners by providing opportunities for interaction that are conducive to active learning. 4) The online teacher promotes learner-learner interaction in online groups to foster collaboration and encourage higher-order thinking skills such as analysis, synthesis, and evaluation. 5) The online teacher can meet the learning needs of all learners, regardless of cultural background and perspective

4. Program Duration

Crowe et al. (2005) reported that new faculty members, who did not have the previous training and experience of teaching summer courses, might struggle to maintain the same rigor of regular classes. At the beginning of teaching intensive courses, even though they did realize that projected student learning objectives should not be altered due to the change of course duration.

Simonson, Schlosser, & Orellana (2011) argued that E-learning courses may take a longer time for instructors to manage compared to the traditional classroom courses.

Collins et al. (2013) discovered that students who participated in intensive formats faced greater challenges than the students that performed standard semester of 15-weeks.

Harlow et al. (2013) noted that students who took part in “introductory physics” class show better results in three months class than in the fast track which had 6-weeks only.

Many studies have been done by academics to see if the duration of studies affects the outcome.

Researchers conclude that students who participate in intensive format performed better. However, Logan and Geltner (2000) found that students that took part in 6-week sessions showed higher rates of success than those took part in 4 months sessions Austin and Gustafson (2006) studied extensively the correlation between student learning and the programme length by using students' demographics. They resulted that students engaged in intensive courses had higher grades compared with the students that took part in the long sessions.

Kucsera and Zimmaro (2010) studied the same course taught both in 9-week intensive and in traditional 15-week formats and found that intensive courses received significantly higher overall course ratings on student evaluations than did traditional methods. They concluded that “negative beliefs concerning intensive courses may be unjustified.”

Tatum (2010) reviewed the literature on fast-track classes, compared them with the traditional courses, and concluded that the current practices in accelerated education have advantages over the traditional ones.

Adams (2013) reported that students in the 10-week accelerated courses had higher grades than those in the corresponding traditional 15-week courses.

In between these two sides, numerous researchers presented inconclusive results showing that course length has no significant effect on student performance.

5. Number of Students

Sieber (2005) propose that a new instructor must not exceed 12 students participating in his class.

Tomei (2006) confirm the class size of 12 depending on the course level of students, without mentioning anything about instructor's online experience.

Burruss, Billing, et al. (2009) establish a maximum number of participants to 20 for an undergraduate course and among 8 and 15 for graduate courses. Also, they try to focus on the improvement of interaction and the balance so as for the students not to feel isolated.

Taft, Perkowski et al. (2011); Sorenson, (2015) Believe that class size is a vital element in the quality of the course. Still, there are many other variables related to the course quantity that had to be established as well. Also, the results of the optimal class size differ. Some authors recommended that course size depends on the type of course and the level of students attending it. Finally, instructor experience has a significant impact on the class size as well, since new a trainer will need fewer participants in order to deliver a quality distance course.

Parks-Stamm et al., (2017) argue that the number of students participating in the distance learning is positively correlated with the quantity and the quality of interaction between trainer and trainee in the course. The authors performed research in 500 online courses looking for interaction as well as student and instructor posts to find factors contributing to those interactions. They resulted that

instructor participation had a significant effect on the student's improvement. Lastly, they found that online classes with 14 or less students had a positive attribute to the student's interaction.

Lowenthal, Nyland, Jung, Dunlap, & Kepka, (2019) Researchers have concluded that the number of participants attending e-learning plays an important role. Still, it is challenging to determine the maximum number of students that can participate due to the factors affecting this decision.

Moreover, class size can affect the e-learning experience, the outcome and lastly the number of people that quit courses.

6.Strategic Planning

Saba, (1999), Watkins & Corry, (2002), Watkins & Kaufman, (2002) support that lack of effective strategic planning aligned with front-end assessment is unfortunate because, by the time the impact of a possibly ineffective intervention (e.g., distance education) is known, the institution may well have sustained damage and/or the ideal time for addressing the problem/opportunity has passed.

Simonson, Schlosser, & Orellana (2011) - According to the authors," Lack of institutional strategic planning for distance education is a significant drawback for quality distance learning. Strategic planning requires leadership at every level of the organization. Not having an institutional plan for distance learning program may lead to fragmentation of initiatives that will yield mixed results across programs".

Ossiannilsson E, Williams K et al. (2015) claimed that the institution must have a strategy well understood from all the members together with a strategy for quality improvement and institutional development. Policies for distance learning must comply with the ethical and legal framework.

7.Learners Satisfaction

As far as maritime training is concerned, the training provider must ensure the satisfaction of the training user. The training provider, developer or facilitator has to continually update the training material and methods to add value to the training program and ensure its learning effectiveness as well as the satisfaction of the seafarers.

The thorough monitoring of the training process, as well as the feedback obtained directly from the users and its analysis, will assist in extracting important conclusions to contribute to the online training systems' improvement—for example, simulators training designers to develop the adequate interface for the material in respect. Also, to facilitate training developers organize the training material or to employ the proper tools, such as work-related scenarios which will directly stimulate the learner's abilities and critical thinking depending on their function – captains or engineers.

When using technology in the learning process, it is the user's satisfaction that is the ultimate goal. In their paper "An evaluation framework in Maritime Education and Training for E-Learning user's environment satisfaction", Quiyou, Nikitakos and Papachristos (2014) mention that the phenomenon of the subjective satisfaction of the user is complicated as it is affected by many factors varying from situation to situation and from individual to individual. The ultimate goal is to find an average, concerning the maritime education and training and any unique factors concerning: the education suitability (maritime educational models), the ability to simulate the functional skills regarding the actual maritime environment, the realism of situations in correspondence with the real-time situations, the controlled functional environment, the good interface for the users and the ability to conduct full-time system control by the educator-trainer. According to them, the satisfaction of the trainees is directly linked to the Utility and the Usability of the training.

Therefore, since the satisfaction of a user of maritime education equipment (simulators, platforms, etc.) is deemed that important, the investigation of the satisfaction of the users is the next important step. This can take place via traditional methods such as feedback questionnaires and interviews, or

by employing more evolved tools such as biometric tools to obtain the user's satisfaction and opinion analysis.

8. Training Duration

In general, regarding the duration of online training, the approach is that “less is more. Sitting through long trainings, especially when these are online so the seafarer will have to sit in front of a screen, is extra difficult. At some time, they will certainly lack focus. The group needs to ensure that every training will be worthwhile. One of the factors for the training to be effective is to keep the seafarer conscious of both starting and ending times.

As per Parkinson's Law, the effort decreases significantly over time.

The training to be effective must be smart, not necessarily long. The idea that “the longer something takes to complete, the better quality it must inherently be” does not apply in our case. Setting the appropriate duration will assist ensure productivity.

Latham, G. P., & Locke, E. A. (1975) “Productivity isn't the only reason shorter meetings are better. Social scientists are discovering evidence that the human brain is wired to pay attention and absorb information for 10 to 18 minutes before it begins to tune out.

Social cognition researcher Dr Paul King made an important discovery that helps explain this phenomenon. His research shows that the more information an audience is asked to consume, the more intense the mental load becomes. Eventually, this “cognitive backlog” becomes so heavy that listeners drop it all and fail to remember anything at all”.

Making the long-short, people will mentally check out of even a well-planned training if it goes on too long. So, training has to be designed in such a way to keep the focus on one or two topics. In a different case, training designers need to ensure that they allow seafarers frequent breaks. Each segment of the training sessions has to be kept short to boost training efficiency and seafarer's satisfaction.

9. Technology Quality Support

Clark & Frith, (2013) argued that in order for a student to acquire distance learning course material, necessary technological competencies are required; meaning to add, manage files, manage e-communications, and be able to use the web browser. The cooperation of trainees and teaching team is an essential aspect for the improvement and the quality of the distance course, in order to ensure that e-learning materials are functional, non-defective and all operating systems in which the resource is being run are connected.

Nsiah & Oti-Boadi, (2015) The provider of the e-learning materials should provide the students with the necessary equipment for the acquisition of the course.

Al-Hunaiyyan et al. (2016). Distance learning courses are delivered using various course management systems and platforms. These tools are pedagogically advanced platforms that provide a wide range of synchronous and asynchronous tools and incorporate mechanisms for evaluating students and tracking student progress. The technical infrastructure must be reliable and easy to use. Effective distance learning requires the course developer to have not only specific qualifications that include the relevant field but also the ability of the teacher to work with a digital program to create an interactive multimedia tool.

10. Institutional / Faculty Support

Faculty members are the pillar of learning. They create opportunities and bonds that link students, content, and engagement. They represent our institutions and programs to the public. Their support is essential to the success of distance learning, and therefore, they must be considered in planning of the distance learning. Faculty support in a distance education environment is a particular concern of accreditors. The readiness of the institution regarding the impact of online courses and programs on faculty workload, compensation, and the institutional reward system must be addressed. Other faculty issues such as training, course development support, course evaluation support, and technical support must be evaluated and addressed.

Savery (2005) described the characteristics of successful distance education faculty members using the acronym **VOCAL**. That is, they are: **Visible**: create a sense of “presence” through a variety of communication channels; **Organized**: provide detailed instructions, clearly sequenced course content, and specific expectations for assignments and other learning activities; **Compassionate**: build a sense of trust among the learning group to overcome the potential isolation of learning at a distance; **Analytical**: design multiple types of assessments that are aligned with specified outcomes; and **Lead by Example**: They provide constructive feedback, model desirable learning strategies, and follow through on promised timelines or activities.

Wolf (2006) Faculty support assist and promotes students continuing their education correctly, provide mentoring and can help with workshops or assignments.

Jaschik, (2007) At many institutions, these encompass the criteria for tenure and promotion. It is not uncommon to meet faculty resistance in adding or expanding distance programs.

El- Seoud et al., (2014) faculty team must be familiar with all technical aspect of the program and to assist students in familiarizing themselves. Moreover, to maintain and increase the quality of the program faculty team and trainers must continue updating, access and modify teaching methods that are using in traditional courses.

ESG (2015) Quality assurance in higher education is based on the institutions’ responsibility for the quality of their program and other provision; therefore, external quality assurance must recognize and supports institutional responsibility for quality assurance.

Kumar & Heathcock (2016) Institutional support is a crucial element of collaboration. Ideally, collaboration should result in alignment with the strategic objectives of the institution, thereby encouraging further institutional support

11. Student Engagement / Motivation

Reupert, Maybery, Patrick, & Chittleborough, (2009) It has been shown that for students that are more engaged with feedback the outcome can be increased motivation and overall contribution to their success.

Delialioğlu (2012) compared student engagement between lecture and problem-based approaches in blended courses and found higher levels of engagement with the latter.

Canadian Government and Transport Canada services (2013) states that the area of administration is where some of the essential differences exist. Mariners education is a challenging task, and many post-secondary education courses do not need student's participation. On the other hand, the Marine Institute and Transport of Canada believes that mariner's participation is critical. The institution had developed a policy and strategy to show what are the benefits of attendance and to motivate mariners to attend the courses. However, to measure attendance is relatively easy, the difficult part is to motivate them to be active during e-classes and to participate. The profits of participating are that trainees had shown better results when the lesson is interactive. This is the reason why instructors continue asking questions to their students to check if they had understood the topic. Moreover,

mariner's engagement can be measured by monitoring student logs to check if they viewed the course, or they dedicated the proper time to study.

Henrie, Halverson et al., (2015) Online technologies have increased the range of ways that engagement can be measured, including analytics to access real-time data beyond the typical end-of-course self-report survey. One study used learning management system log data and brief activity-level surveys to document variations in learner engagement across a semester, finding that explicit instruction and relevant activities were more impactful than the modality.

Mitroussi and Notteboom (2015) concluded that motivation must be addressed at the following levels: the relationship between trainer and trainee, social status of the profession, working conditions, and work/life balance.

Wu et al., (2016) active engagement and interaction help students to develop reflective skills and improve teamwork skills, even though these typically lack in distance education.

12. Interaction

Interaction is a necessary and significant mechanism for knowledge acquisition and the increase of cognitive and physical skills and is one of the most debated topics in distance education (Anderson & Kuskis, 2007; Moore, 2007). Interaction is related to student perception of presence, which is a predictor of student satisfaction in computer-mediated environments (Kuo, Walker, Belland, & Schroder, 2014). Garrison and Cleveland-Innes (2005) found that interaction, both socially and cognitively, presented the greatest student adjustment challenge to online learning. Mahle (2007) concluded that interaction is a primary element of any effective distance education program. Wanstreet (2006) dealt with interaction in online learning and reported on the various definitions of interaction, including an instructional exchange, computer-mediated communication, and social/psychological connections.

Simonson & Schlosser (2011) noted that distance education must offer “the provision of two-way communication so that the student may benefit from or even initiate dialogue”. Initial provisions for interaction were firstly referred to student-instructor interactions, but with the availability of expanded communication technologies. Three forms of interaction exist in the field: student–content, student–instructor, and student–student. It is this third form of communication, reflecting, in part, constructivist perspectives that have increased drastically with the rise of online education. Bernard et.al (2009) have provided important information about the interaction. In the meta-analysis of 74 studies coping with interaction, it was reported that overall, the strength of interactive modes was associated with increased achievement results. More specifically, it was reported that student-to-student and student-to content interactions had a greater impact than the student to teacher interaction.

Nwankwo (2015) showed that what students most value is interaction with course material, followed by interaction with the instructor. Kenyon (2012) also examined the effects of interactivity on learner performance and satisfaction and found a relationship between interaction and gains in mastery of course content.

7. Case study

After reviewing Training policy of Angelicoussis Group regarding online training, we will present the procedure followed for virtual courses.

The courses delivered real time with the use of virtual facilities and platforms, with the participants attending from home or elsewhere. Recent needs, mainly due to corona virus travel restrictions, ask for flexible training solutions. Moreover, technical developments have created the environment for effective remote real time live classrooms.

All modern platforms (e.g. Webex, Zoom etc.) allow for high quality participation and interaction during the courses. This ensures, under conditions, good learning results, close enough to the actual classroom courses. All reputable training providers, including universities, have started offering real time or distance learning with the use of suitable platforms.

Moreover, this type of training can be offered to foreign officers and Greek officers living outside Athens, who had always asked for some kind of distance learning.

Taking into account that there is no international standard applicable to real time virtual classrooms, this procedure was developed to ensure that training is provided under controlled conditions with equivalent results to actual classrooms.

Following procedure will be followed for DELPHIC courses when provided via live virtual classroom:

- 1) Instructor. Will be the one who delivers the actual course in-house and fulfills the DELPHIC MTC requirements.
- 2) Training material. Will be the one developed and used for the actual course, modified if needed to facilitate the live virtual course.
- 3) Platform. Skype or Webex platforms or equivalent will be used. Platform should allow video, voice and chat options. Polling is also required, for the evaluation of the training.
- 4) Max number of participants will be up to 15.
- 5) Total duration of the course will in general be max 5h per day, with breaks every hour. In case of approved e-simulator courses, the makers specifications and recommendations will apply.
- 6) Participants will be registered in each course by the crew depts, depending on their training needs.
- 7) Participants will be officers with code ID, registered in the system. This will ensure proper identification of each participant.
- 8) Invitation, training material and joining instructions will be sent to all participants in advance, copy of the invitation will be saved by DELPHIC.
- 9) Opening of the course will take place half an hour before the start time, to allow adjustments and test of the equipment.
- 10) Instructor will check the list of participants and verify the attendances.
- 11) Evidence of the participations will be kept in the form of photo, recording, auto generated list of participants, chats, polling etc.
- 12) Final list of participants will be signed by the instructor.
- 13) Training Manager/Deputy Training Manager will attend the first course per subject and discuss with instructor and participants areas for improvement. Notes will be kept in course's evaluation form.
- 14) At the end of each course the instructor (or training manager/deputy training manager) will ask orally the participants for their feedback and assessment of the course. Moreover, the polling option will be used and participants will reply online. Results will be saved by DELPHIC. Any recommendations

for improvement will be discussed with training manager.

15) In case a test is required for the specific course it will be scheduled for participants through the Training Platforms (Ocean, SQLearn) or by emails. Records will be kept in DELPHIC.

16) Certificates will be issued as usual, in line with DELPHIC MTC procedures, with reference to the live virtual classroom.

The importance of online training and the need to develop a standard procedure for the delivery of live virtual courses is pointed also with following proposal submitted to IMO by INTERTANKO. INTERTANKO's proposal on intersessional working group on the comprehensive review of the STCW convention is that any certificate issued based upon remote on-line training should contain a relevant notation stating that the certificate was issued based on a course delivered through a live virtual classroom or cloud simulator.

It is unclear to what standards the training is being conducted because there are no globally recognized standards covering the provision of online training. This is not to say that face-to-face instruction is always preferable to online instruction; rather, it simply means that the training recipient will have a distinct pedagogical experience. INTERTANKO intends to work with others to initiate a new work item to develop guidelines for the delivery of the training via a live virtual classroom in the near future.

INTERSESSIONAL WORKING GROUP ON
THE COMPREHENSIVE REVIEW OF THE
STCW CONVENTION
1st meeting
Agenda item 2

ISWG/STCW 1/2/XX
XX July 2024
ENGLISH

Pre-session public release: ☒

COMPREHENSIVE REVIEW OF THE 1978 STCW CONVENTION AND CODE

Identification of Gaps Identified During a Review of the STCW Convention and Code:

Standard for live virtual classrooms

Submitted by INTERTANKO

SUMMARY

<i>Executive summary:</i>	Many training certificates are issued based upon remote on-line training courses as an alternative to actual courses. INTERTANKO believes that there is a need for the development of a standard for the delivery of live virtual classrooms. As such a proposal falls outside of the revision of the STCW Convention, it is proposed that any certificate issued based upon remote on-line training should contain a relevant notation stating that the certificate was issued based on a course delivered through a live virtual classroom or cloud simulator.
<i>Strategic direction, if applicable:</i>	6
<i>Output:</i>	6.17
<i>Action to be taken:</i>	Paragraph 10
<i>Related documents:</i>	Circular Letter No.4876;

Introduction.

1. During the pandemic, much training had to be moved from physical in-person training in a college/training centre, to being delivered remotely in an on-line environment. Such on-line training allows for a reduction in costs of the training provider.
2. This has proved to be advantageous to those paying for the course (whether a government, shipowner or seafarer) and also allowed greater flexibility for the seafarer. This flexibility also relates to the ability to not travel from home and so reduces the burden upon seafarers to be away from home when on leave as well as the financial burden of travel to the training centre.

3. However, as there are no internationally recognised standards covering the provision of on-line training, it is unclear to what standards the training is being undertaken. This is not to state that on-line training is always worse than in-person, just that it will, be a different pedagogical experience for the person undergoing the training.

4. For the employer, it is unclear under what basis the training was undertaken. In the case of simulator training undertaken based on a model course, certificates simply state that the syllabus complied with the model course. No differentiation is made on the certificate between in person and remote or via cloud training. In addition, the development of a standard would ensure a level playing field for all training providers.

Proposal

5. INTERTANKO proposes that as a minimum, all simulator certificates issued following training conducted through remote means should have a notation added to them stating this.

6. The wording of such a notation could be:

Course was delivered via live virtual classroom or cloud simulator.

7. The benefits and advantages of this revolve around the employer having a fuller understanding of the basis of the training undertaken by the seafarer and the seafarer would be able to make a choice as to whether they should undertake a fully remote training course, or one based in the training centre.

8. This proposal refers mainly to bridge, engine and cargo simulator courses via cloud, which are based upon an IMO Model course. Other courses may be considered as well. The proposal does not refer to e-learning, Computer Based Training or other such tools.

9. INTERTANKO intends to work with others to initiate a new work item to develop guidelines for the delivery of the training via a live virtual classroom in the near future. This falls outside of the review of the STCW Convention and so cannot be referred to at this time, hence the necessity for the notation.

Action requested of the ISWG.

10. The ISWG is requested to consider the issue of the addition of a remote training notation on certificates, the information in this document and the appendix and decide as appropriate.

APPENDIX 1

Addition of competences related to mentoring

Identified gap, with references to the existing provision, if applicable	Relevant existing provisions where a gap is identified: 14 one or more sections of the STCW Code
	Following the expansion of remote training, employers and seafarers are unable to differentiate between certification issued following remote v in person training. It is proposed that all certificates issued following training conducted entirely through remote means should have a notation added to them stating this. The wording of such a notation could be: <i>Course was delivered via live virtual classroom or cloud simulator.</i>
Principle(s) ¹	13. Take into account different approaches to organizing and structuring education, training and certification, including formats of delivery of training.
	16. Consider the cumulative impact of requirements for seafarer education, training and certification
Criterion ²	Issues emanating/resulting from external factors including trends and new developments
Specific area(s) ³	15. Lessons learned

¹ Choose any one of the most appropriate principles from the list of 16 principles approved by MSC 107 from the drop-down menu, and add more principles in the free text field, if applicable.

² Choose a criterion i.e. internal or external. If both criteria apply, choose the last option from the drop-down menu.

³ Choose an area amongst the 24 areas in the list from the drop-down menu. If applicable, add more areas, including those approved by MSC 108.

8. Recommendations & Conclusion

Concluding, it is necessary to reiterate the importance of Training for an organization's Human Resources strategy. The importance of the training for the shipping industry is explained if we take into account the competition that exists in the shipping industry, the requirement of multi-skilled seafarers and agile companies and the need to enhance the newly acquired skills for future use, for example, the enormous developments in vessel's IT systems or cyber security processes in place and vessel performance monitoring systems require new skills as well as new training strategies. Moreover, the need to create common understanding for diverse seafarers with varying cultural values, the aim to achieve congruence of individual and organizational goals and in order to aid motivation and the mentality of life-long learning in companies that has indeed been adopted by the majority of industries underline the paramount importance of training. Last, it is also expected from the companies to develop its personnel; both internally by the seafarers but also as demanded due to new requirements, legislation or customer requirements.

Investing on the human asset onboard the vessels has numerous advantages for the shipping company. The incentive of the shipping company to invest on the training of the seafarers can be easily traced if we consider that the shipping industry has been transformed to a knowledge-intensive industry. Also, the fact of shortage and difficulty to employ high quality knowledge seafarers has to be taken into consideration. Crew training enhances not only productivity, but also employability and social stability in the globally competitive environment of the shipping industry.

Seafarers training constitutes added value for the shipping company because it increases motivation to perform onboard, it improves the existing skills and knowledge of the seafarers,

This way, through the greater seafarer commitment, the higher flexibility and the personal development of the seafarers that training contributes to, there is enhanced productivity, improved job performance and overall increased value of the shipping company's human assets.

Assessing the literature review material, the maritime industry specific material, characteristics, insights, as well as the teams proper experience both from the maritime industry and from an HR perspective, a list of quality criteria and quality standards has been compiled in an effort to conclude on the necessary criteria of evaluation of online and distance learning in the maritime sector.

A distinction has been made between the criteria focusing on course and method specifics of the training, adopting a technical focus, and the ones linked to the training strategy of the shipping company, adopting a high-level approach.

Evaluating the course and method specifics and having a technical focus the criteria identified are:

- ✓ The type of online education platforms and the overall virtual classroom experience or user friendliness of the e-platform
- ✓ The support provided before and during the course on behalf of the training facilitators/organizers.
- ✓ The tutoring tools used
- ✓ The technological features of e-platform or virtual classroom
- ✓ The design and flexibility of the system
- ✓ The smooth way of access to the system
- ✓ Navigation throughout the online components of the course is smooth, logical and efficient
- ✓ The technical features and graphics used
- ✓ Tools to assist the trainee become an active learner
- ✓ Availability of functions allowing interaction
- ✓ The duration of the e-learning session
- ✓ The possibility of formal online assessments
- ✓ The possibility of informal self-assessment to the material delivered
- ✓ High-quality internet connection

- ✓ Interactivity through electronic communication between the trainee and the instructor
- ✓ Amount of instructor-led interaction
- ✓ Interactivity and engagement between the trainees and possibility of regular communication with teachers via forum, chat and/or e-mail
- ✓ Availability of online discussion groups
- ✓ The overall attractiveness and usability
- ✓ Data security
- ✓ Availability of the training material after the session
- ✓ Existence of test for self-evaluation
- ✓ Number of students
- ✓ The length of the course
- ✓ Amount of multimedia components in online courses

Evaluating on a high-level approach the quality factors linked to the overall training approach of the Company, reflecting its mentality and defining the overall Company's training strategy the team has concluded on the below criteria:

- Clearly defined approach of the company towards training and especially towards onlinetraining
- Commitment from the top management and company's executives
- Commitment of the Company to invest on the latest trends the technology has to offer so as to ensure high quality online trainings with proper organization and efficient equipment (computers, servers, training facilities both virtual and non-virtual etc)
- Thorough identification of the training needs with involvement of all relevant parties(Seafarers, Managers, Employees)
- Involvement of seafarers in the training design process; end-users should be included in the entire design process right from the beginning so as to safeguard usability
- A system in place in order to measure and evaluate the relevant training KPIs
- Certifications from industry stakeholders when necessary depending on the training topic
- Experienced instructors to be able to perform and pass on the knowledge in a virtual environment
- Adapt the learning style and personalize the learning environment focusing on individual characteristics, where applicable, so as to improve the learning process
- Always keeping in mind that encouraging an exam-oriented education is not at all productive
- Bring more work-related experiences into the learning situation
- Add a problem-centered approach into the learning experience
- Use the seafarers experience as basis for examples and applications
- Encouragement of the seafarers to bring their individual working experience and make it available to the others
- Seek ways for seafarers to enter into the learning experience with a problem-centered approach, and include in the training an immediate application of the content

8.1 Recommendations

Has the training session been successful after all? Were the seafarers satisfied? Did they acquire the desired knowledge, skills, attitudes and behavior the training was aiming to? Did they improve their job performance? Will the training topic have a future application? Did the company achieve the desired results by the trainees? Did the course have quality in content and structure? Did the online training achieve its objective to be used for sharing experiences and good practices? These are questions that people in a shipping company training department try to answer after every training session.

So, an evaluation of the training session, designed based on the quality criteria identified, has to take place in order to improve the training process but also in order to determine the extent to which the trained seafarers have changed as a result of participating in the online training session.

Based on the main factors affecting the effectiveness of online and distance learning as defined by the performed research, the following should be taken into account:

1. Course Structure / Design

As far as the course structure design is concerned, it should be as easy to handle as possible and especially when it comes to crew and officers on board who might not have acquired an in-depth knowledge of technology. Furthermore, the use of presentation images appears to be significantly helpful for the apprehension of the course. Thus, it is suggested that the layout of the course conducted should include diagrams and pictures so as to be more understandable and efficient for the trainees. To conclude, we would like to pinpoint the significance of development of the course design according to the demands and feedback of the participants

2. Evaluation and Assessment

Evaluation and assessment constitute prior factors, since by taking the results into consideration we can point out whether distance learning is effective and whether the students using it are satisfied. Maritime sector should be subject to more regular evaluation due to the fact that asynchronous ways of e-learning are mostly used which require more time to detect and face problems that have occurred. Finally, it is worth mentioning that the evaluation process is a great means through which the quality of the course, the participants, the teacher as well as the program applied can be assessed.

3. Course Instructor / Trainer

Our thesis on the courses addressing to mariners is that they could achieve their full potential of effectiveness if more synchronous methods were used. As demonstrated by the bibliography, learning with the presence of a teacher is more effective than using asynchronous methods. As to the course instructor, he must be a former mariner and have a thorough knowledge of the maritime terms so as to achieve a mutual interaction with the trainees. Last but not least, he must be able to comply with the principles as they are introduced by Ajmera & Dharamdasani, (2014).

4. Programme Duration

As proceeded from the bibliography, the program duration does not seem to be of significant importance. The uppermost factor is the quality of learning itself. That is why institutions should invest more to the quality criteria and to the simplicity of the course design. Moreover, giving extra curriculum and numerous tasks would not assist participant understand better. If the effectiveness of the course is increased, then vice versa the duration of the program can be decreased.

5. Number of Students

It is a foregone conclusion as derived from the research that have been performed, that class size in distance learning is a crucial factor in the training program quality. Unfortunately, class size needs more analysis in order to determine the optimal size. However, an alternative way to find the ideal number of students participating in the course is to monitor their performance and ask them to give feedback relevant to the class size. Low grades and the increasing number of withdrawals are factors that we must take into consideration. Perhaps the class ratio is not ideal, and we have to rectify in order to increase our quality.

6. Strategic Planning

Strategic planning must align with the policy of the company, from our perspective. Furthermore, the policy for distance learning must comply with the ethical and legal framework. Before a distance learning course is created, we must be aware of the vision of the company, gather and analyze relevant information resulting in the creation of a strategy so as our goal is accomplished. Lastly, we should agree on a way to apply our strategy while evaluating and monitoring the whole process of it.

7. Learners' satisfaction

As Quiyou, Nikitakos and Papachristos (2014) mentioned find a common ground into learner's satisfaction is very difficult and complex due to the subjective nature of the perceived "satisfaction". Nevertheless, refreshing courses content with the latest updates and using multiple teaching methods (videos, games, simulations) rather than just presenting slides can only add value to a course and help learners get involved into this process. Close monitoring of the learner's interest not only as described through the assessment forms that are collected and reviewed but during the training sessions is crucial since their satisfaction is directly linked to how useful and easy to follow is the course itself.

8. Training duration

As analyzed by Parkinson in his law, time is the enemy of every instructor no matter how good he is. Especially when dealing with online or distance courses where the danger of getting distracted is higher the courses structure should be very carefully taken into consideration. Unfortunately, all training courses provided to seafarers are extended. For that reason, the course should be designed in such way so to ask for the seafarer's actual participation during the course and not just his passive attendance. Another option that could be considered is to go against the trend that wants maritime courses to be as condensed as possible in order to fill all information in the less possible time. This is happening because seafarers do not want to spend their vacation time into the classrooms (virtual or not).

In that sense dividing the course into more sessions with lesser duration would be more efficient from the perspective of information absorption and participant's concentration.

9. Technology & quality support

As Frith and Clark (2012) analyzed in order to deliver or participate a distance or e-learning course you need to have some technological competencies due to the specific equipment and platforms that have to be used during the course. These competencies are not granted for most people even those who are pretty familiar with the use of personal computers and laptops. Towards this direction the course should be designed to use the simplest and user-friendly platforms to ensure compatibility with the majority of the participants' IT competencies. The course provider should also ensure that the instructor is fully aware of the equipment and platforms to be used and can provide some basic troubleshooting answers to the participants. In addition, step by step guidelines on how to use all relevant platforms and acquire access to all training material can be shared well before the course's implementation. Finally, the formation of specialized IT support team would be ideal. In relation to the duration issue discussed above we can all value the importance of not spending time into simple IT issues that may encountered during the session simply because we were not prepared to deal with them.

10. Institutional/ faculty support

Although all training centers are paying great attention to the faculty members, they choose to implement their courses this seems not be enough. As explained by Savery (2005) the success of the distance learning faculty members is based upon other characteristics as well. Building communications channel with the trainees, providing full details about the content, the course's sequence, the expected assignments and the use of other activities could add value to the institute. Furthermore, building relations with trainee's, designing assessments that are aligned with specific outcomes and leading by giving first the example to the trainees can boost the collaboration with the distance learners and decrease the sense of isolation of distance learning.

11. Student engagement and motivation

Building trainee's engagement and motivation is the most challenging task for every instructor. Since we are referring to distance learning and the trainees are seafarers whom their work/life balance has been set off balance due to their professional status their engagement and motivation is becoming even harder. Providing courses which require seafarer's active participation is crucial as Marine Institute of Canada believes (2013). Their participation can be measured using analytics software in addition to the traditional way where the instructor is pointing out questions to monitor whether what he/she is presenting is followed by them. Active engagement will not only make the course's distance delivery more efficient but will also help trainees enhance their teamwork skills and develop reflective skills although they are remotely present (Wu et al, 2016).

12. Student interaction

Interaction within the instructor and the participants in distance learning is crucial since by interacting the participants getting the sense of presence which the distance learning methods are lacking. This presence is directly linked with the perceived satisfaction as described Kuo, Walker,

Belland, & Schroder (2014). It should be of paramount importance for the distance/e-learning course designer to keep that in mind during the designing process of the course. There are several more interactive methods to deliver your course other than just presenting a PowerPoint to the trainees. Quizzes, tests, hyperlinks with videos or related articles can be used towards this direction. These methods should be utilized by the instructor in every distance course.

8.2 Conclusion

To conclude, as issues for consideration it should be noted that although online and distance training provide a great opportunity for training as these methods are cost efficient, able to be performed at all times regardless if a seafarer is onboard or at the place of his residence and for many other reasons, we need to keep in mind that the companies need to preserve the live trainings with their seafarers in regular intervals. The reasons for this fact do not constitute limitations of the online or distance training, but better said, advantages of the live training.

As it has been analyzed so far there are many positives elements that distance learning can provide to the maritime industry and the seafarers specifically. Unfortunately, some barriers need to be alleviated in order to boost the opportunities emerging from its utilization. Since provided satellite internet services are still evolving there is space for improvement in the near future in order to overcome the connectivity obstacle. Until then a comparison with the quality of a distance/e-learning course provided on board and ashore would have not any sense. The integration of synchronous and asynchronous methods is imperative in maritime education, and immediate solutions must be found.

A very important issue that was revealed from through this research is that there are not common quality standards for the maritime training field set by the regulator. Towards this direction IMO through STCW should provide further and more specific guidelines on what is to be assessed from the flag states when approving METIs and certain training distance/e-learning courses. Distance learning is giving seafarers new opportunities and alternative options on their education and since seafarers are the core of the maritime industry, the quality of their education must be regulatory protected. COVID-19 developments have accelerated the distance training establishment thus IMO must be monitoring the developments and adopt the relevant regulatory framework respectively.

Live training is great opportunity for teambuilding. Both between the Company's seafarers themselves and between the seafarers and office personnel. Live trainings, if we take into account the space, the material distributed, the premises of the company, even the coffee and the lunch breaks constitute factors that can affect deeper a person, thus the seafarers become more receptive to behaviors, values, culture of the Company. So, online learning should by no means totally replace the live training but to act complementary. And something to consider is too sophisticated IT systems may not be adequate as they will create difficulties and challenges to the seafarer as the technology itself may distract or confuse the user and not allow him to concentrate to the knowledge-training message and the result of the training may not be successful after all. The technology can be extremely helpful, but it will not help if the users are not learning out of it.

Also, it should be noted that the employment of IT tools in the seafarers learning process are only one important aspect of a knowledge management system. It is strongly underlined that human interaction and learner's engagement is indispensable so as to create a functional working solution for knowledge management design and implementation and an effective and good performing training.

For the knowledge to be able to be transferred efficiently and successfully, the Company has to ensure the active participation of their seafarers through interaction and socialization so as to get the maximum result out from the active engagement of the participants. This will certainly add value and increase the possibilities of successful implementation of the knowledge or skills obtained.

9. References

- Abou El-Seoud, S., Seddiek, N., Taj-Eddin, I., Ghenghesh, P., Nosseir, A., & El-Khouly, M. (2014). E-Learning and Students' Motivation: A Research Study on the Effect of E-Learning on Higher Education. *International Journal of Emerging Technologies in Learning (IJET)*, 9(4), 20. <https://doi.org/10.3991/ijet.v9i4.3465>
- Adams, G. L. (2013). A comparison of student outcomes and overall retention between a 10-week accelerated and a 15-week traditional curriculum in a post-secondary apprenticeship training program (Doctoral dissertation, Regent University).
- Ajmera, R., & Dharamdasani, D. K. (2014). E-Learning Quality Criteria and Aspects. *International Journal of Computer Trends and Technology*, 12(2), 90–93. <https://doi.org/10.14445/22312803/ijctt-v12p117>
- Al-Hunaiyyan, A., Al-Hajri, E., Alzayed, A., & Alraqqas, B. (2016). Towards an Effective Distance Learning Model: Implementation Framework for Arab Universities. *International Journal of Computer Application*. Volume 6, No. 5, 2250-1797.
- Anderson, T., & Kuskis, A. (2007). Modes of interaction. In M. G. Moore (Ed.), *Handbook of distance education* (pp. 295–309). Mahwah, NJ: Erlbaum.
- Angelicoussis Shipping Group | Transporting commodities across the globe. (2020, May 14). *Angelicoussis Shipping Group*, [online] Retrieved from: <https://angelicoussisgroup.com/#home-mission-left>
- Armstrong, M. (2006). *A Handbook of Human Resource Management Practice* 10th Edition (Tenth edition). Kogan Page Business Books.
- Ascione, L. *How to address faculty's 3 biggest online learning concerns*. (2017, March 6). ECampus News. [online] Retrieved from: <https://www.ecampusnews.com/2017/03/07/facultys-online-learning-concerns/>
- Austin, A. M., & Gustafson, L. (2006). Impact of course length on student learning. *Journal of Economics and Finance Education*, 5(1), 26-37.
- Bari, M., & Djouab, R. (2014). Quality Frameworks and Standards in E-Learning Systems. *International Journal of the computer, the Internet and Management*, 22(3)1-7
- Bauk, S., Kopp, M., & Avramović, Z. (2013). A Case Study on Introducing E-learning into Seafarers' Education. *JITA - Journal of Information Technology and Applications (Banja Luka) - APEIRON*, 5(1), 34–42. <https://doi.org/10.7251/jit1301034b>
- Bernard, R. M., Abrami, P. C., Borokhovski, E., Wade, C. A., Tamim, R. M., Surkes, M. A., & Bethel, E. C. (2009). A Meta-Analysis of Three Types of Interaction Treatments in Distance Education. *Review of Educational Research*, 79(3), 1243–1289. <https://doi.org/10.3102/0034654309333844>

- Brosser, L., & Vrabie, C. (2015). The Quality Initiative of E-Learning in Germany (QEG)-Management for Quality and Standards in E-Learning. *Procedia - Social and Behavioral Sciences*, 186, 1146–1151. <https://doi.org/10.1016/j.sbspro.2015.04.214>
- Burruss, N. M., Billings, D. M., Brownrigg, V., Skiba, D. J., & Connors, H. R. (2009). Class Size as Related to the Use of Technology, Educational Practices, and Outcomes in Web-Based Nursing Courses. *Journal of Professional Nursing*, 25(1), 33–41. <https://doi.org/10.1016/j.profnurs.2008.06.002>
- Chen, X., Bai, X., & Xiao, Y. (2017). The Application of E-learning in Maritime Education and Training in China. *TransNav, the International Journal on Marine Navigation and Safety of Sea Transportation*, 11(2), 163–168. <https://doi.org/10.12716/1001.11.02.19>
- Clark, R. C., & Mayer, R. E. (2016). *e-Learning and the Science of Instruction: Proven Guidelines for Consumers and Designers of Multimedia Learning* (4th ed.). Wiley.
- Collins, A., Hay, I., & Heiner, I. (2013). Start With The End In Mind: Experiences Of Accelerated Course Completion By Pre-Service Teachers And Educators. *Australian Journal of Teacher Education*, 38(10), 1–20. <https://doi.org/10.14221/ajte.2013v38n10.4>
- Crowe, A. R., Hyun, E., & Kretoivics, M. (2005). Reflections on summer teaching: academic rigor or curriculum light? *Summer Academe*, 5, 7.
- Delialioğlu, Ö. (2012). Student engagement in blended learning environments with lecture-based and problem-based instructional approaches. *Journal of Educational Technology & Society*, 15(3), 310–322.
- Dickmann M.(2016). *Strategic Performance Management*,[Class handout]. Alba Graduate Business School,MSc in Strategic HRM.
- Elias, T. (2010). Universal instructional design principles for Moodle. *The International Review of Research in Open and Distributed Learning*, 11(2), 110. <https://doi.org/10.19173/irrodl.v11i2.869>[online] Retrieved from: <http://www.irrodl.org/index.php/irrodl/article/view/869>
- EMSA. (2023). *Annual Overview of Marine Casualties and Incidents 2019*. EMCIP. [online] Retrieved from: <https://www.emsa.europa.eu/publications/item/5176-emsa-facts-figures-2023.html>
- EOCCS. (2024). *EOCCS Standards and Criteria*. [online] Retrieved from: https://www.efmdglobal.org/wp-content/uploads/EOCCS_StandardsCriteria.pdf
- ESG (2015). Standards and Guidelines Assurance in the European Higher Education Area. Brussels, Belgium.[online] Retrieved from: https://www.enqa.eu/wp-content/uploads/2015/11/ESG_2015.pdf
- European Association for Quality Assurance in Higher Education. (2018). *Considerations for quality assurance of e-learning provision* (No. 26). ENQA AISBL.

<https://www.enqa.eu/wp-content/uploads/Considerations-for-QA-of-e-learning-provision.pdf>

- Finkelstein, J. (2006). *Learning in real time: Synchronous teaching and learning online*. Jossey-Bass.
- Fokas D. (2023) *Delphic MTC Annual Report 2023*. Athens, Greece.
- Frith, K. H., & Clark, D. J. (2012). *Distance Education in Nursing (Springer Series: Teaching of Nursing)* (3rd ed.). Springer Publishing Company.
- Frydenberg, J. (2002). Quality Standards in eLearning: A matrix of analysis. *The International Review of Research in Open and Distributed Learning*, 3(2), 1–15. <https://doi.org/10.19173/irrodl.v3i2.109>
- Gallo, C. (2014, March 13). *The Science Behind TED's 18-Minute Rule*. Www.Linkedin.Com. [online] Retrieved from <https://www.linkedin.com/pulse/20140313205730-5711504-the-science-behind-ted-s-18-minute-rule/>
- Garrison, D. R., & Cleveland-Innes, M. (2005). Facilitating Cognitive Presence in Online Learning: Interaction Is Not Enough. *American Journal of Distance Education*, 19(3), 133–148. https://doi.org/10.1207/s15389286ajde1903_2
- Grigoraș, G., Dănciulescu, D., & Sitnikov, C. (2014). Assessment Criteria of E-learning Environments Quality. *Procedia Economics and Finance*, 16, 40–46. [https://doi.org/10.1016/s2212-5671\(14\)00772-2](https://doi.org/10.1016/s2212-5671(14)00772-2)
- Guskey, T. R. (1999). *Evaluating Professional Development (1-off Series)* (1st ed.). Corwin.
- Harlow, J. J. B., Harrison, D. M., & Honig, E. (2015). Compressed-format compared to regular-format in a first-year university physics course. *American Journal of Physics*, 83(3), 272–277. <https://doi.org/10.1119/1.4905171> [online] Retrieved from: <http://www.upscale.utoronto.ca/PVB/Harrison/CompressedFormat/CompressedFormat.pdf>
- Henrie, C. R., Halverson, L. R., & Graham, C. R. (2015). Measuring student engagement in technology-mediated learning: A review. *Computers & Education*, 90, 36–53. <https://doi.org/10.1016/j.compedu.2015.09.005>
- Herring, M., & Smaldino, S. (2001). *Planning for interactive distance education: A handbook* (2nd ed.). Bloomington, IN AECT Publications.
- Hieu, P. T., Bolmsten, J., & Kitada, M. (Eds.). (2015). *Utilizing E-learning tools to foster knowledge management practices in Maritime Education & Training*. [online] Retrieved from: https://www.researchgate.net/publication/283485182_Utilizing_E-learning_tools_to_foster_knowledge_management_practices_in_Maritime_Education_Training
- Hu, W., Wu, B., Jia, X., Yi, X., Duan, C., Meyer, W., & Kaufman, J. C. (2013). Increasing Students' Scientific Creativity: The "Learn to Think" Intervention Program. *The Journal of Creative Behavior*, 47(1), 3–21. <https://doi.org/10.1002/jocb.20>

- ITF (2017). STCW: A guide for seafarers – Taking into account the 2010 manila amendments[online] Retrieved from: <https://www.itfseafarers.org/en/resources/materials/stcw-convention-and-code>
- Jaschik, S. (2007). Inside Higher Ed. (2007, February 27). *Jerry Springer U.*<https://www.insidehighered.com/news/2007/02/27/jerry-springer-u> Retrieved from:
- Kenyon, P.L. Content interactivity: The effect of higher levels of interactivity on learner performance outcomes and satisfaction in Web-based military training. Ph.D. thesis, WaldenUniversity/. [online] Retrieved from <https://www.learntechlib.org/p/128795/>.
- King, P. E. (2008). Listening. *The International Encyclopedia of Communication*, 1–13. <https://doi.org/10.1002/9781405186407.wbiecl027>
- Ki-Yin C., Ay-Shiou C., Jian-Hung S. & Tao-Heng C. (2019), Effectiveness of web-based training compliance with seafarers international training convention.*Journal of Marine Science and Technology*, Vol. 27, No. 1, pp. 8-16 <https://scholars.ntou.edu.tw/handle/123456789/20487?mode=full>
- Kucsera, J. V., & Zimmaro, D. M. (2010). Comparing the Effectiveness of Intensive and Traditional Courses. *College Teaching*, 58(2), 62–68. <https://doi.org/10.1080/87567550903583769>
- Kumar, S., & Heathcock, K. (2016). Information Literacy Support for Online Students in Higher Education. *Professional Development and Workplace Learning*, 1380–1396. <https://doi.org/10.4018/978-1-4666-8632-8.ch075>
- Kuo, Y.-C., Walker, A. E., Schroder, K. E. E., & Belland, B. R. (2014). Interaction, Internet self-efficacy, and self-regulated learning as predictors of student satisfaction in online education courses. *The Internet and Higher Education*, 20, 35–50. <https://doi.org/10.1016/j.iheduc.2013.10.001>
- Latham, G. P., & Locke, E. A. (1975). Increasing productivity and decreasing time limits: A field replication of Parkinson’s law. *Journal of Applied Psychology*, 60(4), 524–526. <https://doi.org/10.1037/h0076916>
- Lau, Y., & Ng, A. K. Y. (2015). The motivations and expectations of students pursuing maritime education. *WMU Journal of Maritime Affairs*, 14(2), 313–331. <https://link.springer.com/article/10.1007/s13437-015-0075-3>
- Lobrigo, E., & Pawlik, T. (2015). Maritime policy and the seafaring labor market. *WMU Journal of Maritime Affairs*, 14(1), 123–139. <https://doi.org/10.1007/s13437-015-0086-0>
- Logan, R., & Geltner, P. (2000). The influence of session length on student success. Report for Santa Monica College.

- Lowenthal, P. R., Nyland, R., Jung, E., Dunlap, J. C., & Kepka, J. (2019). Does Class Size Matter? An Exploration into Faculty Perceptions of Teaching High-Enrollment Online Courses. *American Journal of Distance Education*, 33(3), 152–168. <https://doi.org/10.1080/08923647.2019.1610262> [online] Retrieved from <https://www.tandfonline.com/doi/full/10.1080/08923647.2019.1610262>
- Mahle, M. (2007). Interactivity in distance education. *Distance Learning*, 4(1), 47–51.
- Maran Dry Management Inc. | COMMITTED, TO SAFE, CLEAN AND EFFICIENT BULK CARRIER OPERATIONS. (n.d.). *Maran Dry*, [online] Retrieved from: <http://www.marandry.com/>
- Maran Dry Management Inc. | Crewing. (n.d.). *Maran Dry*, [online] Retrieved from: <https://marandry.com/services/#crewing>
- Maran Dry Management Inc. | Fleet List. (n.d.). *Maran Dry*, [online] Retrieved from: <https://marandry.com/our-fleet/>
- Maran Dry Management Inc. | Our Mission. (n.d.-a). *Maran Dry*, [online] Retrieved from: <http://www.marandry.com/>
- Maran Gas Maritime Inc. (n.d.). *Maran Gas*, [online] Retrieved from: <http://www.marangas.com/>
- Maran Gas Maritime Inc. | Crewing. (n.d.). *Maran Gas*, [online] Retrieved from: <https://marangas.com/services/#crewing>
- Maran Gas Maritime Inc. | Fleet Overview. (n.d.). *Maran Gas*, [online] Retrieved from: <https://marangas.com/our-fleet/>
- Maran Gas Maritime Inc. | Our Mission. (n.d.). *Maran Gas*, [online] Retrieved from: <http://www.marangas.com/>
- Maran Gas Maritime Inc. | Our Vision. (n.d.). *Maran Gas*, [online] Retrieved from: <http://www.marangas.com/>
- Maran Tankers Management Inc | Fleet. (n.d.). *Maran Tankers*, [online] Retrieved from: <https://marantankers.gr/our-fleet/>
- Maran Tankers Management Inc | Our Mission. (n.d.). *Maran Tankers*, [online] Retrieved from: <https://marantankers.gr/>
- Maran Tankers Management Inc | Our Vision. (n.d.). *Maran Tankers*, [online] Retrieved from: <https://marantankers.gr/>
- Maran Tankers Management Inc. . | Crewing. (n.d.). *Maran Tankers*, [online] Retrieved from: <https://marantankers.gr/services/#crewing>

- MarTID, 2021. Maritime Training Insights Database: Training practices report, [online] Retrieved from: <https://martid.org/reports/>
- Martin, F., Polly, D., Jokiah, A., & May, B. (2017). GLOBAL STANDARDS FOR ENHANCING QUALITY IN ONLINE LEARNING. *The Quarterly Review of Distance Education*, 18(2), 1-10 [online] Retrieved from: https://www.researchgate.net/publication/320839797_GLOBAL_STANDARDS_FOR_ENHANCING_QUALITY_IN_ONLINE_LEARNING
- Martinez, R., Liu, S., Watson, W., & Bichelmeyer, B.A. (2006). Evaluation of a Web-Based Master's Degree Program: Lessons Learned from an Online Instructional Design and Technology Program. *The Quarterly Review of Distance Education*, 7(3), 267-283.
- Mitroussi, K., & Notteboom, T. (2014). Getting the work done: motivation needs and processes for seafarers and dock workers. *WMU Journal of Maritime Affairs*, 14(2), 247–265. <https://doi.org/10.1007/s13437-014-0064-y>
- Moore, M. G., & Diehl, W. C. (2019). *Handbook of Distance Education* (4th ed.). Routledge.
- Moore, N. (2007). (Re)Using Qualitative Data? *Sociological Research Online*, 12(3), 1–13. <https://doi.org/10.5153/sro.1496>
- Nsiah, G. K. B., & Oti-Boadi, M. (2015). Assessing the Effectiveness of Distance Education within the Context of Traditional Classroom. *Creative Education*, 06(08), 707–710. <https://doi.org/10.4236/ce.2015.68072>
- NSQ National Standards for Quality On Learning. (2019). *National Standards for Quality Online Teaching*. VLLA. [online] Retrieved from: <https://www.nsqol.org/the-standards/quality-online-teaching/>
- Nwankwo, A.A. (2015). Students' Learning Experiences and Perceptions of Online Course Content and Interactions. *Walden Dissertations and Doctoral Studies*. [online] Retrieved from: <https://scholarworks.waldenu.edu/dissertations/188>
- Orellana, A., Hudgins, T. L., & Simonson, M. (2009). *The Perfect Online Course: Best Practices for Designing and Teaching (Perspectives in Instructional Technology and Distance Education)* Miller, C. Chapter 15 Enhancing web-based instruction using a person-centred model of instruction. Information Age Publishing.
- Ossiannilsson E., Williams K., Camilleri A. & Brown M. European Association of Distance Teaching Universities – EADTU. (2015, May). *Quality models in online and open education around the globe: State of the art and recommendations* (No. 978-82-93172-33–8, PDF: 978-82-93172-34–5). International Council for Open and Distance Education. [online] Retrieved from: <https://www.oerknowledgecloud.org/record1007>
- Our History. (2019, January 8). *Angelicooussis Shipping Group*, [online] Retrieved from: <https://angelicooussisgroup.com/our-history/>
- Pallis, A. A., & Ng, A. K. Y. (2011). Pursuing maritime education: an empirical study of

- students' profiles, motivations and expectations. *Maritime Policy & Management*, 38(4), 369–393. <https://doi.org/10.1080/03088839.2011.588258>
- Palloff, R. M., & Pratt, K. (2011). *The Excellent Online Instructor: Strategies for Professional Development* (1st ed.). Jossey-Bass.
 - Parks-Stamm, E. J., Zafonte, M., & Palenque, S. M. (2016). The effects of instructor participation and class size on student participation in an online class discussion forum. *British Journal of Educational Technology*, 48(6), 1250–1259. <https://doi.org/10.1111/bjet.12512>
 - Pawan B.(2016) .*International HR Strategies*, [Class handout]. Alba Graduate Business School, MSc in Strategic HRM.
 - Praetorius, G., Kataria, A., Petersen, E. S., Schröder-Hinrichs, J.-U., Baldauf, M., & Kähler, N. (2015). Increased Awareness for Maritime Human Factors through e-learning in Crew-centered Design. *Procedia Manufacturing*, 3, 2824–2831. <https://doi.org/10.1016/j.promfg.2015.07.762>
 - Quiyou, H., Nikitakos, N.V., & Papachristos D. (2014). of IAMU AGA 14 26-28 October 2013 115 An Evaluation Framework In Maritime Education And Training For E-Learning User's Environment Satisfaction.
 - Reupert, A., Maybery, D., Patrick, K.J., & Chittleborough, P. (2009). The importance of being human: Instructors' personal presence in distance programs. *The International Journal of Teaching and Learning in Higher Education*, 21, 47-56.
 - Saba, F. (1999). Planning for distance education: Too much focus on delivery systems? *Distance Education Report*, 3(4), 5.
 - Sandell, P. I. (2015). Digital Learning Together – Teaching Marine Insurance and Charterparty Issues for Future Leaders and Experts of the Shipping Companies. *Book of Proceedings* 1,330-335.
 - Savery, J. (2005). Be VOCAL: Characteristics of successful online instructors. *Journal of Interactive Online Learning*, 4(2), 141–152.
 - Scudamore, B. (2016, June 16). *10 Simple Ways To Have More Productive Meetings*. Forbes. [online] Retrieved from: <https://www.forbes.com/sites/brianscudamore/2016/06/15/10-simple-ways-to-have-more-productive-meetings/>
 - Services/Newbuildings. (2019, December 5). *Maran Tankers*, [online] Retrieved from: <https://marantankers.gr/services/#newbuildings>
 - Shelton, K., & Saltsman, G. (2004). The dotcom bust: A postmortem lesson for online

education. *Distance Learning*, 1(1), 19-24.

- SHELL. (2020). *Care for people – Resilience programme*. SHELL HSSE Materials for Contractors. [online] Retrieved from: <https://hsse.shell.com/business/maritime-hsse-site/care-for-people.html>
- Slimp, M. (2014). Trends in distance education-What college leaders should consider. *Instructional Technology Council* 1(1),1-14[online] Retrieved from: <https://intc.memberclicks.net/assets/docs/TrendsinDistanceEducationNov2014FINALWEBVERSION.pdf>
- Sieber, J. E. (2005). Misconceptions and realities about teaching online. *Science and Engineering Ethics*, 11(3), 329–340. <https://doi.org/10.1007/s11948-005-0002-7> [online]Retrieved from:<https://link.springer.com/article/10.1007/s11948-005-0002-7>
- Simonson, M., Schlosser, C., & Orellana, A. (2011). Distance education research: a review of the literature. *Journal of Computing in Higher Education*, 23(2–3), 124–142. <https://doi.org/10.1007/s12528-011-9045-8>. [online] Retrieved from <https://www.learntechlib.org/p/50932/>.
- Simonson, M., Smaldino, S. E., Albright, M., & Zvacek, S. (2011). *Teaching and Learning at a Distance: Foundations of Distance Education (5th Edition)* (5th ed.). Pearson.
- Simonson, M., Smaldino, S., & Zvacek, S. M. (2014). *Teaching and Learning at a Distance: Foundations of Distance Education, 6th Edition* (Revised ed.). Information Age Publishing.
- Smaldino, S. E., Lowther, D. L., Mims, C., & Russell, J. D. (2015). *Instructional technology and media for learning* (11th ed.). Columbus, OH: Pearson.
- Smyth, R. (2014). Daniel, John & Uvalić-Trumbić, Stamenka ed (2013) A guide to quality in online learning. Contact North (Ontario, Canada) Noisbn28 pp Free download <http://www.contactnorth.ca/tips-tools/guide-quality-online-learning>. *British Journal of Educational Technology*, 45(1), E1. <https://doi.org/10.1111/bjet.12127>
- Sorensen, C. (2015). An Examination of the Relationship between Online Class Size and Instructor Performance. *The Journal of Educators Online*, 12(1), 140–159. <https://doi.org/10.9743/jeo.2015.1.3>[online] Retrieved from <http://files.eric.ed.gov/fulltext/EJ1051032.pdf>
- STCW: *International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, Including 2010 Manila Amendments*.(2020) IMO. [online] Retrieved from: <https://www.imo.org/en/ourwork/humanelement/pages/stcw-conv-link.aspx>
- Stein, J., & Graham, C. R. (2014). *Essentials for Blended Learning: A Standards-Based Guide (Essentials of Online Learning)* (1st ed.). Routledge.
- Stopford, M. (2009). *Maritime Economics 3e* (3rd ed.). Routledge.
- Taft, S. H., Perkowski, T., & Martin, L. S. (2011). A Framework for Evaluating Class Size

- inOnline Education. *The Quarterly Review of Distance Education*, 12(3), 181-197. [online] Retrieved from https://www.researchgate.net/publication/285968533_A_framework_for_evaluating_class_size_in_online_education
- Tatum, B. C. (2010). Accelerated education: learning on the fast track. Publication of National University, 34.
 - Theotokas, I. (2018). *Management of Shipping Companies (Routledge Maritime Masters)* (1st ed.). Routledge.
 - Tomei, J. (2006). The impact of online learning on faculty load: Computing the ideal class size for online learning. *Journal of Technology and Teacher Education*, 14, 531-541. [online] Retrieved from: https://www.researchgate.net/publication/255566949_The_Impact_of_Online_Teaching_on_Faculty_Load_Computing_the_Ideal_Class_Size_for_Online_Courses
 - Transport Canada (2013) Quality Assurance and Control Requirements for Course Providers, *National Pleasure Craft Operator Competency Program*. [online] Retrieved from: <https://tc.canada.ca/sites/default/files/migrated/tp15215e.pdf>
 - Vai, M., & Sosulski, K. (2011). *Essentials of Online Course Design: A Standards-Based Guide (Essentials of Online Learning)*. Routledge.
 - Ventikos, N. P., Lykos, G. V., & Padouva, I. I. (2014). How to achieve an effective behavioral-based safety plan: the analysis of an attitude questionnaire for the maritime industry. *WMU Journal of Maritime Affairs*, 13(2), 207–230. https://www.researchgate.net/publication/272015158_How_to_achieve_an_effective_behavioral-based_safety_plan_the_analysis_of_an_attitude_questionnaire_for_the_maritime_industry
 - Wanstreet, C. (2006). Interaction in online learning environments: A review of the literature. *Quarterly Review of Distance Education*, 7(4), 399–411.
 - Watkins, R., & Corry, M. (2002). Virtual universities: Challenging the conventions of education. In W. Haddad and A. Draxler (Eds.), *Technologies for education: Potentials, parameters and prospects*. Paris: UNESCO.
 - Watkins, R., & Kaufman, R. (2002). Is your distance education program going to accomplish useful results? In M. Silberman (Ed.), *The 2002 training and performance sourcebook* (pp. 89–95). Princeton, NJ: McGraw-Hill.
 - Wolf, P. D. (2006). Best practices in the training of faculty to teach online. *Journal of Computing in Higher Education*, 17(2), 47–78. <https://doi.org/10.1007/bf03032698>
 - Wu, X., Liu, Y., Zhang, Y., & Ji, L. (2016). Providing Quality Online Education for Continuing Education. *International Journal of Information and Education Technology*, 6(2), 157–161. <https://doi.org/10.7763/ijiet.2016.v6.677>
 - Yarbrough, D. B., Shulha, L. M., Hopson, R. K., & Caruthers, F. A. (2011). *The program*

evaluation standards: A guide for evaluators and evaluation users (3rd ed.). Thousand Oaks, CA: SAGE.

- Zirkin, B.G. & Sumler, D.E. (1995). Interactive or Non-interactive? That Is the Question!!! An Annotated Bibliography. *The Journal of Distance Education / Revue de l'education Distance*, 10(1), 95-112. Athabasca University Press. [online] Retrieved from: <https://www.learntechlib.org/p/80816/>.

10. Appendices

- Malta Registry Approval letter for Delphic MTC
- DNV-GL Standard for certification of Maritime Training Providers (DNVGL-ST-0029)
- DNV-GL LNG Training Course Approval (DNVGL-ST-008)
- Delphic MTC lists of provided courses
- STCW sections A-I/6 & B-I/6
- IMO model courses list

List of Figures:

Figure 1: Number of attendances & courses (internal & external) 2022-2023	27
Figure 2: Number of attendances & courses for office staff 2014-2023	28
Figure 3: Flowchart of web-based learning for STCW training courses	7
Figure 4: Distribution of accident events for 2014 - 2022.....	9
Figure 5: Relationship between accident events and the main contributing factors for 2014 - 2022..	10
Figure 6: Shell resilience training program	12
Figure 7: How Shell's Reflective Learning help develop a Safety Culture through behavioral change	13
Figure 8: Vessel Operators - Change in training methods usage over the past year & expected change in training methods usage for the upcoming year.....	18
Figure 9: METI - Change in training methods usage over the past year & expected change in training methods usage for the upcoming year.	19

List of Tables:

Table 1: Inhouse & external seminars and attendances per company for 2019.....	25
Table 2: DELPHIC MTC issued certificates for 2019.....	26
Table 3: Synchronous, asynchronous & blended learning (definition, platforms, pros & cons).....	38
Table 4: Factors affecting the effectiveness of online training and distance learning	45



Merchant Shipping Directorate



Transport Malta

Certificate No. MTC7429

MS45/127/01

MARITIME TRAINING CENTRE APPROVAL CERTIFICATE

Issued for the purpose of

**THE INTERNATIONAL CONVENTION ON STANDARDS OF TRAINING,
CERTIFICATION AND WATCHKEEPING FOR SEAFARERS, AS AMENDED**

This is to certify that Delphic Maritime Training Center, is hereby approved by the Merchant Shipping Directorate of the Authority for Transport in Malta as a Maritime Training Centre and has been found to be in accordance with the requirements set out in the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, as amended and meets the Standards for Approval of Maritime Training Centres issued by the Merchant Shipping Directorate

Approval Date

13 July 2012

Re-Approval Date

11 November 2022

Expiry Date

10 November 2027



Iyad Sammut
Registrar-General
of Shipping and Seamen

Conditions of Approval are found overleaf

This certificate is the sole property of the Authority for Transport in Malta. It may be withdrawn without notice, at any time, in the event of non-compliance with the above-mentioned international regulations and national regulations and requirements.

Transport Malta is the Authority for Transport in Malta set up by Act XV of 2009



MANAGEMENT SYSTEM CERTIFICATE

Certificate No:
n1812617-bzj
DNV id No:
113443
Date of issue:
2022-11-28

Particulars of Company¹

Company Name: Delphic Maritime Training Center
Company Address: 216-226 Doiranis Str.
Kallithea
17674 Athens
GREECE

Branch offices, if applicable

Name	Address
-	-

This is to certify:

That the management system of the company has been audited and that it complies with the requirements of:

Standard for Certification DNV-ST-0029 Maritime Training Providers

Areas of Activity/Capacity of Training Provider:

☒ Maritime Training Centre ☐ Maritime Simulator Centre ☐ Maritime Academy
☐ Offshore Training Centre ☐ Offshore Simulator Centre

This Certificate is valid until 2027-12-10, subject to annual verification.

Completion date of audit on which this Certificate is based: 2022-11-28

Issued at Athens, Greece on 2022-11-28



for DNV

This document is signed electronically in accordance with ISO
PALS/CRC 34Rev 2. Validation and authentication can be obtained from
trust.dnv.com by using the Unique Tracking Number (UTN):
n1812617-bzj and ID: 113443

Spyros Lamprinopoulos
Auditor

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

¹ See paragraph 1.1.2 of the ISM Code.



Form code: MTP 301

Revision: 2022-09

www.dnv.com

Page 1 of 2

UTN: n1812617-bzj



LEARNING PROGRAMME CERTIFICATE

Certificate No:
n1819092-xud
DNV Id No:
113443
Date of issue:
2023-01-17

Particulars of Company

Company Name:	Delphic Maritime Training Center
Company Address:	216-226 Doiranis Str. Kallithea 17674 Athens GREECE

Branch offices, if applicable

Name	Address
"	"

This is to certify:

that the learning programme / training course

LNG Training Course

has been reviewed by DNV and that DNV is satisfied that the learning programme is in compliance with DNV-ST-0008 - Learning Programmes and the following content standard(s):

SIGTTO LNG Shipping Suggested Competency Standards (2005)

Provided that the requirements for retention of the certificate will be complied with and the certificate will not be withdrawn, this certificate is valid until: **2028-02-16**.

Issued at **Athens, Greece** on **2023-01-17**



for DNV

This document is signed electronically in accordance with IMO
FAL S/Circ 28/Rev.2. Validation and authentication can be obtained from
trust.dnv.com by using the Unique Tracking Number (UTN):
n1819092-xud and ID: 113443

Spyros Lamprinopoulos
Auditor

ANNEX 1 LIST OF COURSES DELIVERED IN 2023 (total 138 titles)

- AALBORG BOILER CONTROL SYSTEMS (037)
- AALBORG TECHNAVA BOILER CONTROL SYSTEMS (196)
- ANCHORING OPERATIONS (327)
- ANTI CORRUPTION (359)
- ANTI-PIRACY TRAINING SEMINAR (182)
- APPRAISAL EVALUATION OF STAFF (257)
- BALLAST WATER TREATMENT SYSTEM (231)
- BBS BEHAVIOUR BASED SAFETY (259)
- BMS (BRIDGE MANOEUVERING SIMULATOR) - JUNIOR (080)
- BMS (BRIDGE MANOEUVERING SIMULATOR) - SENIOR (002)
- BRIDGE SIMULATOR SHIPS HANDLING REFRESHER (320)
- BRIDGE TEAM AND RESOURCE MANAGEMENT COURSE (029)
- BTM BRM REFRESHER (337)
- BTM WITH THE USE OF SIMULATOR (251)
- BULKERS CARGO & BALLAST HANDLING SIMULATOR COURSE (355)
- CALIBRATION OF EAGLE AND GX-2001 GAS DETECTORS (132)
- CARGO AND BALLAST HANDLING SIMULATOR JUNIOR (229)
- CARGO AND BALLAST HANDLING SIMULATOR REFRESHER (376)
- CARGO AND BALLAST HANDLING SIMULATOR SENIOR (161)
- CARGO CLAIMS (242)
- CHARTERING AND RELATED MATTERS. PRACTICAL PROBLEMS AND CASE STUDIES. (005)
- COLREG (255)
- COMBO SEMINAR MTM HSQE DPT. (384)
- COMMERCIAL ASPECTS OF LNGs OPERATION (221)
- COMMERCIAL ASPECTS OF TANKER OPERATIONS (097)
- COMPATIBILITY & OPTIMOOR TRAINING (374)
- CRANE OPERATORS TRAINING (173)
- CUSTODY TRANSFER MEASUREMENT SYSTEM CTMS (373)
- CYBER SECURITY AWARENESS (281)
- CYBER SECURITY AWARENESS REFRESHER (362)
- CYBER SECURITY OFFICER (294)
- DPA SEMINAR (262)
- DRAGER DETECTORS (289)
- DUAL FUEL LNG (367)
- ECDIS FURUNO TYPE SPECIFIC (197)
- ECDIS GENERIC IMO 1.27 (210)
- ECDIS JRC NEW 9201 TYPE SPECIFIC (267)
- ECDIS JRC TYPE SPECIFIC (041)
- ECDIS REFRESHER (253)
- ECOCHLOR BALLAST SYSTEM (330)
- EFFECTIVE COMMUNICATION OFFICE STAFF (306)
- ELEARNING SKILLSOFT NEGOTIATION (298)
- ENGINE ROOM RESOURCE MANAGEMENT COURSE (036)

- FAMILIARIZATION WITH POWERBI AUTOMATED REPORTS (390)
- FIRE SAFETY SYSTEMS (207)
- FREE FALL LIFE BOAT OPERATOR (269)
- HATCH COVERS MDM (279)
- HUMAN PERFORMANCE - 5 PRINCIPLES (363)
- IGF BUNKER SIMULATOR (378)
- IGF CODE ADVANCED (371)
- IGF CODE BASIC (370)
- INCIDENT INVESTIGATION-ROUTE CAUSE ANALYSIS (167)
- INTERNET FUNDAMENTALS (056)
- INTERPERSONAL SKILLS, TEAMBUILDING, COMMUNICATION (201)
- INTRODUCTION TO OUR GROUP COMPANIES-ELEMENTS OF MARITIME SAFETY & MARINE POLLUTION (CADETS) (021)
- ISM/ISPS INTERNAL AUDITOR (048)
- ISO 45001, Health and Safety Management systems (380)
- ISO 9001 QUALITY MANAGEMENT (225)
- KAPA INVENTORY AND PURCHASING (276)
- KAPA PMS TRAINING SEAGOING OFFICERS (156)
- KATRADIS ROPES + WIRES (295)
- KONGSBERG COURSE STEP I (101)
- KONGSBERG COURSE STEP II (248)
- KORONAKIS ROPES (220)
- LEADERSHIP AND MANAGERIAL SKILLS (358)
- LICOS CARGO HANDLING SIMULATOR FOR LNGs (106)
- LICOS CARGO HANDLING SIMULATOR REFRESHER (382)
- LIFE BOAT OPERATOR (CONVENTIONAL LIFE BOATS) (280)
- LUB OILS SEMINAR (038)
- MAN B&W ME COURSE (140)
- MAN ME-GI INTRODUCTION (389)
- MANAGEMENT - LEADERSHIP FOR OFFICE STAFF (245)
- MANAGEMENT OF CHANGE MOC (265)
- MARINE CHEMICALS - WATER TREATMENT TECHNOLOGY (026)
- MARINE ENVIRONMENTAL PROTECTION LEGISLATION -ISO 14001 (064)
- MARINE INSURANCE (290)
- MDM CREW FORUM (261)
- MDM IN-HOUSE REFRESHER TRAINING FOR DECK OFFICERS (258)
- MDM IN-HOUSE REFRESHER TRAINING FOR ENGINEERS (204)
- MDM SCRUBBERS OPERATION COURSE (335)
- MDM TECHNICAL MATTERS (082)
- MEDICAL CARE (116)
- MENTAL HEALTH AWARENESS (352)
- MENTAL HEALTH AWARENESS AND SPEAK UP CONFIDENTLY (386)
- MENTAL HEALTH AWARENESS AND SPEAK UP CONFIDENTLY (386)
- MENTAL HEALTH -STRESS MANAGEMENT (361)
- MENTAL HEALTH -STRESS MANAGEMENT (361)
- MGM CREW FORUM (224)
- MGM ESCOBAR SIMULATOR SIPORE (278)
- MGM TRAINING ON MOORING PLATFORM (369)

- MGM WINGD XDF ENGINE TRAINING (351)
- MICROSOFT POWER POINT 2000 (060)
- MLC (217)
- MTM CREW FORUM (227)
- MTM DECK OFFICERS REFRESHER WORKSHOP (282)
- MTM HSQE WORKSHOP (292)
- MTM JUNIOR ENGINEERS WORKSHOP (379)
- MTM MAN ME-GI (366)
- MTM MOORING OPERATIONS (274)
- MTM OPERATION AND MAINTENANCE OF RIKEN KEIKI FIXED GAS DETECTION SYSTEMS (368)

- MTM SCRUBBERS OPERATION COURSE (335)
- MTM SENIOR ENGINEERS REFRESHER WORKSHOP (285)
- MTM WARTSILA RT-FLEX ENGINE (346)
- NAVIGATIONAL AUDIT (250)
- OBM PAINTS COATINGS (241)
- OIL RECORD BOOK PART I AND SOPEP/VRP (061)
- OIL RECORD BOOK PART II (338)
- OPERATION AND CALIBRATION OF RIKEN KEIKI FIXED GAS DETECTION SYSTEMS (354)

- PARAMINA AIR COMPRESSORS (385)
- PASSAGE PLAN 1d (342)
- PASSAGE PLAN 3d (387)
- PERFORMANCE MANAGEMENT FOR MANAGERS (323)
- PERFORMANCE MANAGEMENT INTRODUCTION (322)
- PORT STATE CONTROL UPDATE ON NEW INSPECTION REGIME (188)
- PORT STATE CONTROL-VETTING INSPECTIONS-GREEN AWARD INSPECTIONS (174)

- RESILIENCE, LET, REFLECTIVE LEARNING AWARENESS (291)
- RIGHTSHIP INSPECTIONS (383)
- RISK ASSESSMENT AND MANAGEMENT (081)
- SANCTIONS IN SHIPPING (344)
- SHIP SAFETY OFFICER (115)
- SHIPBOARD ENERGY CONSERVATION - ISO 50001 (163)
- SHIPPING FINANCE (356)
- SIGTTO LNG 3-d CLASSROOM (240)
- SIRE 2.0 (377)
- STCW 2010 UPDATE (200)
- STRESS MANAGEMENT COURSE (365)
- SUEZ CANAL TRANSIT BRIDGE SIMULATOR (219)
- SUPERINTENDENT COURSE (271)
- SURVEYS AND CERTIFICATION (042)
- TAMROTOR COMPRESSORS. (008)
- TEAM TEC-MARINE INCINERATORS/OPERATION AND MAINTENANCE (148)
- TIME MANAGEMENT (357)
- TRAIN THE TRAINER (152)
- UPDATE ON REGULATION (260)

In section **A-I/6** Convention is setting standards on the following training sectors:

- 1) Training and assessment
 - a. Each Party shall ensure that all training and assessment of seafarers for certification under the Convention is:
 - i. structured in accordance with written programs, including such methods and media of delivery, procedures, and course material as are necessary to achieve the prescribed standard of competence; and
 - ii. conducted, monitored, evaluated, and supported by persons qualified in accordance with paragraphs 4, 5 and 6.
 - b. Persons conducting in-service training or assessment on board ship shall only do so when such training or assessment will not adversely affect the normal operation of the ship and they can dedicate their time and attention to training or assessment.
- 2) Qualifications of instructors, supervisors, and assessors'
 - a. Each Party shall ensure that instructors, supervisors and assessors are appropriately qualified for the particular types and levels of training or assessment of competence of seafarers either on board or ashore, as required under the Convention, in accordance with the provisions of this section.
- 3) In-service training
 - a. Any person conducting in-service training of a seafarer, either on board or ashore, which is intended to be used in qualifying for certification under the Convention, shall:
 - i. have an appreciation of the training program and an understanding of the specific training objectives for the particular type of training being conducted.
 - ii. be qualified in the task for which training is being conducted; and
 - iii. if conducting training using a simulator:
 - have received appropriate guidance in instructional techniques involving the use of simulators; and
 - have gained practical operational experience on the particular type of simulator being used.
 - b. Any person responsible for the supervision of in-service training of a seafarer intended to be used in qualifying for certification under the Convention shall have a full understanding of the training program and the specific objectives for each type of training being conducted.
- 4) Assessment of competence

Any person conducting in-service assessment of competence of a seafarer, either on board or ashore, which is intended to be used in qualifying for certification under the Convention, shall:

 - i. have an appropriate level of knowledge and understanding of the competence to be assessed.
 - ii. be qualified in the task for which the assessment is being made.
 - iii. have received appropriate guidance in assessment methods and practice.
 - iv. have gained practical assessment experience; and

- v. if conducting assessment involving the use of simulators, have gained practical assessment experience on the particular type of simulator under the supervision and to the satisfaction of an experienced assessor.
- 5) Training and assessment within an institution
- Each Party which recognizes a course of training, a training institution or a qualification granted by a training institution, as part of its requirements for the issue of a certificate required under the Convention, shall ensure that the qualifications and experience of instructors and assessors are covered in the application of the quality standard provisions of section A-1/8. Such qualification, experience and application of quality standards shall incorporate appropriate training in instructional techniques, and training and assessment methods and practice, and shall comply with all applicable requirements of paragraphs 4 to 6.

In addition, in section **B-I/6** Convention conveys the following Guidance regarding training and assessment:

- 1) Qualifications of instructors and assessors
- Each Party should ensure that instructors and assessors are appropriately qualified and experienced for the particular types and levels of training or assessment of competence of seafarers, as required under the Convention, in accordance with the guidelines in this section.
- 2) In-service training and assessment
- a. Any person, on board or ashore, conducting in-service training of a seafarer intended to be used in qualifying for certification under the Convention should have received appropriate guidance in instructional techniques.
 - b. Any person responsible for the supervision of in-service training of a seafarer intended to be used in qualifying for certification under the Convention should have appropriate knowledge of instructional techniques and of training methods and practice.
 - c. Any person, on board or ashore, conducting an in-service assessment of the competence of a seafarer intended to be used in qualifying for certification under the Convention should have:
 - i. received appropriate guidance in assessment methods and practice and
 - ii. gained practical assessment experience under the supervision and to the satisfaction of an experienced assessor.
 - d. Any person responsible for the supervision of the in-service assessment of competence of a seafarer intended to be used in qualifying for certification under the Convention should have a full understanding of the assessment system, assessment methods and practice.'

Especially regarding e-learning STCW is setting the below requirements as stated in section B-I/6:

- 3) Use of distance learning and e-learning

Parties may allow the training of seafarers by distance learning and e-learning in accordance with the standards of training and assessment set out in section A-1/6 and the guidance given below.

- 4) Guidance for training by distance learning and e-learning
 - a. Each Party should ensure that any distance learning and e-learning program:
 - i. is provided by an entity that is approved by the Party.
 - ii. is suitable for the selected objectives and training tasks to meet the competence level for the subject covered.
 - iii. has clear and unambiguous instructions for the trainees to understand how the program operates.
 - iv. provides learning outcomes that meet all the requirements to provide the underpinning knowledge and proficiency of the subject.
 - v. is structured in a way that enables the trainee to systematically reflect on what has been learnt through both self-assessment and tutor-marked assignments; and
 - vi. provides professional tutorial support through telephone, facsimile or e-mail communications.
 - b. Companies should ensure that a safe learning environment is provided and that there has been sufficient time provided to enable the trainee to study.
 - c. Where e-learning is provided, common information formats such as XML (Extensible Markup Language), which is a flexible way to share both the format and the data on the World Wide Web, intranets and elsewhere, should be used.
 - d. The e-learning system should be secured from tampering and attempts to hack into the system.
- 5) Guidance for assessing a trainee's progress and achievements by training by distance learning and e-learning:

Each Party should ensure that approved assessment procedures are provided for any distance learning and e-Learning program, including

 - i. clear information to the trainees on the way that tests and examinations are conducted and how the results are communicated.
 - ii. have test questions that are comprehensive and will adequately assess a trainee's competence and are appropriate to the level being examined.
 - iii. procedures in place to ensure questions are kept up to date.
 - iv. the conditions where the examinations can take place and the procedures for invigilation to be conducted.
 - v. secure procedures for the examination system so that it will prevent cheating, and.
 - vi. secure validation procedures to record results for the benefit of the Party.
- 6) Register of approved training providers, courses and programs

Each Party should ensure that a register or registers of approved training providers, courses and programs are maintained and made available to companies and other Parties on request.

	Model course	Edition	Course's subject
1	1.01	2014	Basic Training for Oil and Chemical Tanker Cargo Operations
2	1.02	2015	Advanced Training for Oil Tanker Cargo Operations
3	1.03	2016	Advanced Training for Chemical Tanker Cargo Operations
4	1.04	2014	Basic Training for Liquefied Gas Tanker Cargo Operations
5	1.05	2015	Advanced Training for Liquefied Gas Tanker Cargo Operations
6	1.07	2017	Radar Navigation, Radar Plotting and use of ARPA Radar Navigation at Operational Level
7	1.08	2019	Radar, ARPA, Bridge Teamwork and Search and Rescue Radar Navigation at Management Level
8	1.10	2014	Dangerous, Hazardous and Harmful Cargoes
9	1.13	2000	Elementary First Aid
10	1.14	2000	Medical First Aid
11	1.15	2000	Medical Care
12	1.19	2019	Proficiency in Personal Survival Techniques
13	1.20	2000	Fire Prevention and Fire Fighting
14	1.21	2016	Personal Safety and Social Responsibilities
15	1.22	2002	Ship Simulator and Bridge Teamwork
16	1.23	2000	Proficiency in Survival Craft and Rescue Boats (other than Fast Rescue Boats)
17	1.24	2000	Proficiency in Fast Rescue Boats
18	1.25	2015	General Operator's Certificate for GMDSS
19	1.26	2015	Restricted Operator's Certificate for GMDSS
20	1.27	2012	Operational Use of Electronic Chart Display and Information Systems (ECDIS)
21	1.29	2000	Proficiency in Crisis Management and Human Behaviour Training Including Passenger Safety, Cargo Safety and Hull Integrity Training
22	1.30	2017	Onboard Assessment
23	1.31	2002	Second-Class Radioelectronic Certificate for Global Maritime Distress and Safety System Radio Personnel
24	1.32	2005	Operational use of Integrated Bridge Systems including Integrated Navigation Systems
25	1.33	2005	Safety of Fishing Operations (Support Level)
26	1.34	2019	Automatic Identification Systems (AIS)
27	1.35	2007	Liquefied Petroleum Gas (LPG) Tanker Cargo and Ballast Handling Simulator
28	1.36	2019	Liquefied Natural Gas (LNG) Tanker Cargo and Ballast Handling Simulator
29	1.37	2007	Chemical Tanker Cargo and Ballast Handling Simulator
30	1.38	2011	Marine Environmental Awareness
31	1.39	2014	Leadership and Teamwork
32	1.40	2018	Use of Leadership & Managerial Skills
33	1.41	2018	Passenger Ship Crowd Management Training
34	1.42	2018	Passenger Ship Crisis Management and Human Behaviour Training
35	1.44	2018	Safety Training for Personnel
36	1.45	2019	Safe handling and transport of solid bulk cargoes
37	2.03	2000	Advanced Training in Fire Fighting
38	2.06	2002	Oil Tanker Cargo and Ballast Handling Simulator
39	2.07	2017	Engine-Room Simulator
40	3.03	2004	Survey of Machinery Installations
41	3.04	2004	Survey of Electrical Installations
42	3.05	2004	Survey of Fire Appliances and Provisions
43	3.06	2004	Survey of Life-Saving Appliances and Arrangements
44	3.07	2004	Hull and Structural Surveys
45	3.08	2004	Survey of Navigational Aids and Equipment
46	3.09	2001	Port State Control
47	3.11	2014	Safety Investigation into Marine Casualties and Marine Incidents
48	3.12	2017	Assessment, Examination and Certification of Seafarers
49	3.13	2014	SAR Administration (IAMSAR Manual Volume I)
50	3.14	2020	SAR Mission Coordinator (IAMSAR Manual, Volume II)
51	3.15	2014	SAR On-Scene Coordinator (IAMSAR Manual Volume III)
52	3.17	2015	Maritime English
53	3.18	2001	Safe Packing of Cargo Transport Units (CTUs)
54	3.19	2012	Ship Security Officer
55	3.20	2011	Company Security Officer
56	3.21	2015	Port Facility Security Officer
57	3.22	2010	Flag State Implementation
58	3.23	2011	Actions to be Taken to Prevent Acts of Piracy and Armed Robbery
59	3.24	2018	Security Awareness Training for Port Facility Personnel with Designated Security Duties
60	3.25	2011	Security Awareness Training for all Port Facility Personnel
61	3.26	2012	Security Training for Seafarers with designated Security Duties
62	3.27	2012	Security Awareness Training for all Seafarers
63	4.05	2014	Energy Efficient Operation of Ships
64	6.09	2017	Training Course for Instructors
65	6.10	2012	Train the Simulator Trainer and Assessor
66	7.01	2014	Master and Chief Mate
67	7.02	2014	Chief Engineer Officer and Second Engineer Officer
68	7.03	2014	Officer in Charge of a Navigational Watch
69	7.04	2014	Officer in Charge of an Engineering Watch
70	7.05	2008	Skipper on a Fishing Vessel
71	7.06	2008	Officer in Charge of a Navigational Watch on a Fishing Vessel
72	7.07	2008	Chief Engineer Officer and Second Engineer Officer on a Fishing Vessel
73	7.08	2014	Electro-Technical Engineer
74	7.09	2017	Ratings Forming Part of a Watch in a Manned Engine-room or Designated to Perform Duties in a Periodically Unmanned Engine-room
75	7.10	2017	Ratings as Able Seafarer Deck
76	7.11	2017	Basic Training for Ships Operating in Polar Waters
77	7.12	2017	Advanced Training for Ships Operating in Polar Waters
78	7.13	2019	Basic training for masters, officers, ratings and other personnel on ships subject to the IGF Code
79	7.14	2019	Advanced training for masters, officers, ratings and other personnel on ships subject to the IGF Code
80	7.15	2019	Electro-Technical Rating
81	7.16	2019	Ratings as Able Seafarer Engine

