European Maritime and Fisheries Fund

Project: 863713-MarLEM

Maritime Logistics Engineering and Management

Organizations gaining strategic advantages supported on Logistics competences define the competition paradigm in their sectors

Training Design Specification

Deliver 2.2. - Training Design Specification

Version 1.0

31 March 2020

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Terms and Definitions

21st Century skills

A blend of content knowledge, specific skills, expertise and literacies which students need to master to succeed in work and life.

Assessment

The method of determining if a training need exists and, if it does, what training is required to fill the gap.

Behaviour change

Any modification in behaviour altering the way you act and react. The change may happen spontaneously and involuntarily without any intervention, or it may be systematic and prompted by conditioning.

Blue Growth

European long-term strategy to support sustainable growth in the marine and maritime sectors as a whole. Seas and oceans are drivers for the European economy and have great potential for innovation and growth.

Capacity building

Long-term, continuing process, in which all stakeholders participate (ministries, local authorities, non-governmental organizations and water user groups, professional associations, academics and others). In 1991 it was defined as a) the creation of an enabling environment with appropriate policy and legal frameworks; (b) institutional development, including community participation (of women in particular); and (c) human resources development and strengthening of managerial systems.

Competency

An observable behaviour supported by specific knowledge, skills, and attitudes. Each competency has a specific result or output.

Content Analysis

A procedure for organizing narrative and qualitative data into emerging themes and concepts. Usually associated with a quantitative form of analysis in which the themes are counted or measured.

European Skills Competences and Occupations classification (ESCO)

European multilingual classification of Skills, Competences, Qualifications and Occupations. ESCO works as a dictionary, describing, identifying and classifying professional occupations, skills, and qualifications relevant for the EU labour market and education and training.

Feasibility Analysis

A cost-benefit analysis completed prior to conducting training. It is an estimate of the cost of the training weighed against the possible benefits that could be achieved if training were conducted

Formal education

Education that is institutionalised, intentional and planned through public organisations and recognised private bodies, and in their totality constitute the formal education system of a country. Formal education programmes are thus recognised as such by the relevant national education or equivalent authorities.

Gap Analysis

Also called performance analysis; identifies the difference between current performance and the desired performance.

Gender balance

This term refers to the equal participation and human resources for women and men in all areas of work, projects or programmes.

Governance

It is the establishment of policies and continuous monitoring of their proper implementation, by the members of the governing body of an organization.

Interested party / stakeholder

person or organization that can affect, be affected by, or perceive itself to be affected by a decision or activity.

Learning Objectives

Describes a specific behaviour, conditions, level of achievement and is written from the learner's point of view.

Ocean literacy

The understanding of the ocean´s influence on you and your influence on the ocean.

Organization

Person or group of people that has its own functions with responsibilities, authorities and relationships to achieve its objectives.

Paradigm

Example or pattern; an outstandingly clear or typical example or archetype.

Paradigm shifters

Elements of fundamental changes in the basic concepts and experimental practices of a scientific discipline.

Requirement

Need or expectation that is stated, generally implied or obligatory.

Skill

The ability to do an activity or job well, especially because you have done it many times

Target Population

The individual or group involved in a needs assessment or training program.

Trainer

A term used in a corporate setting for a teacher. Also instructor.

VET Standards

This term refers to the key elements of lifelong learning systems equipping people with knowledge, know-how, skills and/or competences required in particular occupations or more broadly on the labour market. It responds to the needs of the economy but also provides learners with skills for personal development and active citizenship. VET contributes to enterprise performance, competitiveness, research and innovation and is central to employment and social policy.

Vocational Education Training

Sometimes simply known as vocational training, it is the training in skills and teaching of knowledge related to a specific trade, occupation or vocation in which the student or employee wishes to participate. Vocational education may be undertaken at an educational institution, as part of secondary or tertiary education, or may be part of initial training during employment, for example as an apprentice, or as a combination of formal education and workplace learning.

Acronyms and Abbreviations

A3ES – Agência de Acreditação e Avaliação do Ensino Superior

DGAM – Direção Geral da Autoridade Marítima

DGRM – Direção Geral dos Recursos Marítimos

EC – European Commission

EASME – European Agency for Small and Medium Enterprises

EMFF – European Maritime Fisheries Fund

ENQA – European Network on Quality Assurance

ISO – International Standards Organization

JRC – Joint Research Centre

MarLEM – Maritime Logistics Engineering and Management

QES – Quality, Environment and Safety

SOLE – Society of Logistics Engineering

TP – Target Population

History of Changes

Table 1 - History of changes

Version	Publication date	Changes
1.0	31.03.2020	Initial version
2.0	14.05.2020	Version thoroughly reviewed to be shared and publicised

Contractual aspects

Project: Maritime Logistics Engineering and Management (MarLEM)

https://grupoqualiseg.com/marlem

Deliverable – D2.2 – Design Specification

Work package: Wp2 – Situation Analysis

Task: 2.5 and 2.6 – Solutions' identification and Design Specification

Confidentiality: public

Version: 2.0

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Leader entity – Qualiseg

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Legal Disclaimer

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1 Executive Summary

Objective

To document the objectives and the expected outcomes of the joint-master course in Maritime Logistics Engineering and Management Competence Requirements, regarding the development of the training plan which will be developed in WP3, tasks 3.1 to 3.3.

Scope

The deliverable D2.2 – training design specification is related to the Tasks 2.5 to 2.6, which include the following activities:

- Solutions' identification
- Design specification development.

To reach the established objective and having in mind the aim of the MarLEM project to develop a joint-master course in Maritime Logistics Engineering and Management, relevant stakeholders have been involved in the design process to meet their requirements, in order to ensure the results in terms of the skills development and competence acquiring. This design specification is strongly based on the end-user needs report which has been previous developed, reviewed and approved by the Project Coordination Team, attention made to the Grant Agreement regarding to accomplish with agreed main elements and aspects.

2 Introduction

The purpose of this deliverable, as a technical output of the project, is to integrate the potential training solutions to close the competence gaps, establishing the objectives and the expected outcomes of the training.

The deliverable describes the steps and actions performed in Tasks 2.5 and 2.6 during the first six months of the project and can be considered as a key input for the definition of the Master Course training design to be developed in WP3 and to the training planning to be developed in WP4.

The employed methodology follows the ISO 10015 (ISO, 2017) international standard and the training design best practices. When a training solution is selected to close the competence gaps, training needs will be specified and documented. The specification for training needs will document the objectives and the expected outcomes of the training.

This document will become part of the training plan specification and will include a record of the objectives which will be considered as inputs for designing and planning training and for monitoring the training process.

3 Needs to be addressed

As reported in the end-user needs report it is consensual that a skills gap exists, essentially, in the following skills typologies:

- Technical
- Management
- Digital
- Green and,
- Soft skills.

  An important conclusion points to the need of developing technical skills in a balanced way with soft skills.

Regarding the provision of education and training, actions to be designed and planned need to be adjusted to different trainee groups, as follows:

- Students/new workers - there is the need of developing specific training in the port and maritime field (observing processes and activities, taking part in real actions and/ or simulating their execution), granting them the proper knowledge of this specific reality, both in the technical and cultural domains
- Workers already in the workplace - considering the little time to attend formal training classes, there is a need for a modular training approach preferably combining virtual training / e-learning and real actions in the field through on-job-training and Work-Based Learning.

4 Potential training solutions

Regarding to cope with the above-mentioned needs, the following solutions may be considered, planned and properly implemented:

- To assume the concepts of Strategic Logistics, Integrated Logistics, Logistics Engineering, Industrial Engineering and Management and Value Chain Management, integrated and adapted to the Maritime reality

- To innovate in the field of Maritime Logistics education and training, transforming and evolving the training programs aiming at improving the projected image to students, and workers already in the field. Simultaneously, develop a coherent communication plan to project a positive image of the port and maritime sector, attracting professionals to a different and valuable career

- In terms of soft skills a particular attention should be paid to the "XXI Century Skills / Learning" approach and to the OECD Conceptual Framework for Education for 2030. Even though soft skills relevance is continuously increasing, as consensually perceived, a proper balance between technical and soft skills has to be achieved

- Methodologies of training, such as Project-Based Learning and Work-Based Learning, should be considered regarding to provide training in a bottom-up and sea-shore approaches. It is important to implement a training approach “from practical to conceptual”, assuring that all students will develop and implement a concrete project applied to the maritime reality, allowing students to put in place their own ideas, projects, products or start-ups, thus developing entrepreneurship capabilities. To increase the confidence of implementing those practical to conceptual and sea to shore approaches, the availability of relevant experts to teach and train students, including the involvement of specialized professionals from port and maritime domain is a requirement to be properly operationalised

- To align “market voice” from port and maritime industries and sector representative authorities with the “process voice” from universities it is important to support the master course in a knowledge triangle involving those typologies of entities, granting

that needed skills will be developed and expected competences will be achieved. Complementarily, the knowledge triangle has the potential to play a decisive role in the validation of the course effectiveness to contribute to bridge the skills' gap and to the right alignment between the master course results and its objectives

- In order to affirm the master course at European level and increase the mobility of students, teachers and maritime professional trainers a proper involvement of all academic partners of the MarLEM project has to be implemented, which will set the proper basis to the master course escalation to the partners countries, in a first stage, and to other countries as reasonable

- To ensure the certification of the Master Degree Program is in accordance with EU regulations in the European Higher Education Area (EHEA), by Portuguese, British and Greek authorities (respectively A3ES, QAA and HQA), enhancing the attractiveness to students and professionals, through the Master Program's recognition and certification at EU level, increasing career value

- To provide the relevant technical and operational recognition of the Master Program by Port and Maritime Authorities, such as International Maritime Authority (IMO), DG MARE, EMSA and other Port and Maritime Authorities of European countries.

5 MarLEM master course concept and structure

5. 1. Concept

Assuming the existence of gaps and needs in higher education the MarLEM concept is the development of a **Joint Master course in Maritime Logistics Engineering and Management**, not only aligned with filling those gaps and needs, but also aligned with the "**XXI Century Skills / Learning**" approach and with the **OECD Conceptual Framework for Education for 2030**.

Our vision to MarLEM is the development of expertise in the field of Strategic Logistics, Integrated Logistics (fig. 1), Logistics Engineering, Industrial Engineering and Management and Value Chain Management.

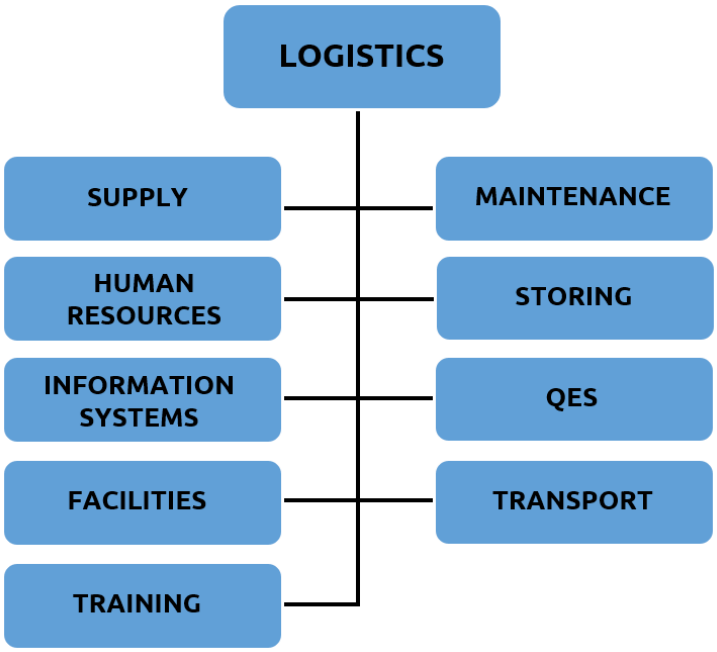

fig. 1 – Integrated Logistics

Being an education and training program in the scope of the higher education, that will provide engineers and managers, it is of the most importance to **provide embracing skills of all management levels: strategic thinking, tactical/management and operational**. In the figure 3 the MarLEM areas of expertise to be developed are represented at the organizational proper management level.

fig. 2 – Areas of expertise by organizational management level

Having in mind that Industrial Engineering and Management is increasingly considered an excellent area of education, providing professionals with proper skills to industrial environment, MarLEM concept integrates this perspective and proposes to develop the Engineering and Management skills to professionals acting on port and maritime activities. Thus, the master course will tackle the development of the adequate skills enabling proper competences to work in the crucial areas of Strategic Logistics and Logistics Engineering, helping professionals to build strategic thinking and acquire the operational knowledge to assure the execution of different maritime-related tasks.

5.2. Approach

MarLEM project management approach is based on the principles of the Quality Management (emphasis on the ISO 9001 training requirements) in general and, in particular, it is supported in the requirements of the international standard on Training Management (ISO 10015). More recently the development of the ISO 21001:2018 - Educational organizations — Management systems for educational organizations, reinforced the standardization framework in the education field, constituting an important tool to develop course programs such as MarLEM.

As can be seen in figure 1, MarLEM has its basis in the Skills' needs, thus the training situation analysis is the first step that will allow the training design, development and planning, in accordance with ISO 10015. The design specification is the last output of the situation analysis and the main input to the training design step.

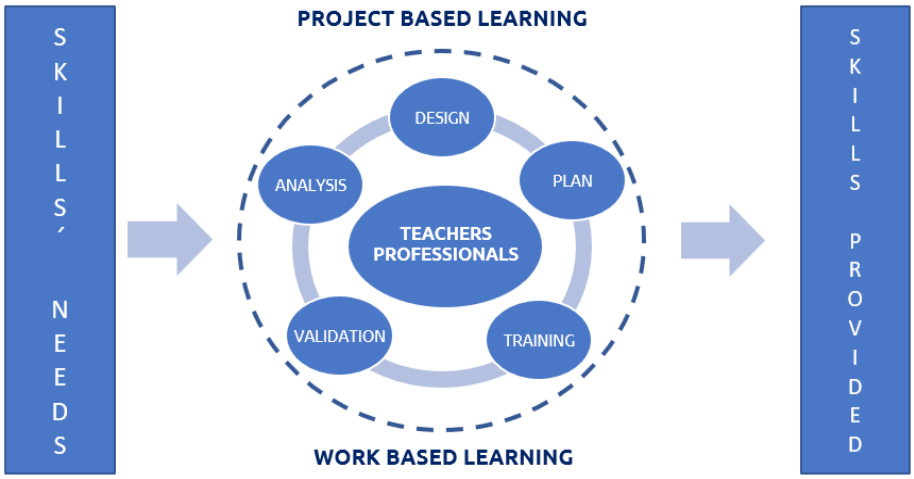

fig. 3 – The MarLEM approach according ISO 10015

Regarding to obtain the desired contribution from industrial/market perspective on the master's design, development, validation and certification the involvement of maritime clusters (Fórum Oceano and MSE), through workshops, hackathons and meetings with representatives from main entities in the Port and Maritime domain will be stimulated and properly implemented. On the authorities' side, Qualiseg will work with Portuguese Navy to

reach an extensive involvement with relevant authorities related to port and maritime domain and, by this way, to attain the desired cooperation and inherent inputs to the training process.

5.3. Program structure

In terms of the Master Program structure, the course will comprise 1 or 2 years and it will host students and elements of the workforce with 3 years of higher education and will take place, as a Joint-Master Course, in the MarLEM's academic partners. Applied students will receive academic / technical and soft skills (1st year/semester) and applied / practical knowledge on the 2nd year/semester, as shown in figure 4.

Year 1 / Semester 1		Year 2 / Semester 2
Academic & Scientific; Scientific & Technological		Technological & Practical
Soft Skills	**Technical Skills**	**Project / Work examples**
Literacy of Sustainability;	Strategic Logistics;	Developing a Strategic Logistics Plan;
Global Awareness;	Lean Thinking;	Business Analysis, regarding new business opportunities;
Leadership and Responsibility;	Innovation and Entrepreneurship at Sea;	Organizational Management analysis;
Critical Thinking;	Port and Maritime Business Analysis;	Process activities waste – how to evolve to zero waste;
Resilience;	Supply Chain Sustain. and Resilience;	SCM (Supply Chain Management) applied to a business;
Being Accountable;	Integrated Logistics Support;	Logistics Operational Plan;
Information and Communication;	Port and Maritime Operational Support;	ILS (Integrated Logistic Support) on a specific Maritime Operation;
Problem Solving.	Systems Engineering.	Economical and Financial dimensions of Maritime Economy.
	Project Based Learning (PBL)	
		Work Based Learning (WBL)

fig. 4 – The master course proposed structure

The one year version of the master course is particularly directed to professionals already working, despite may integrate young workers to pretend to develop skills in the port and maritime domain. Depending on the targeted population, training actions, projects and practical cases have to be adjusted and adapted to the specific training receiver.

MarLEM project has in its genesis the concept of innovative education and training centred in the methodologies of Project Based Learning and Work Based Learning, meaning even in the 1st year / semester each student will be guided on the selection of a project to be developed on the 2nd year/semester. On the 2nd year/semester students will learn by working on the selected project and applying it to the port-maritime reality, i.e. ships, port management companies, transport and storing, etc...(.) On this real world of acquiring skills and developing competences, the Portuguese Navy living lab (ships, technical directorates, shipyard, stores, etc…) will be available to receive students and involve them in the “maritime world”.Conclusions and recommendations

6. Conclusions and recommendations

The first set of the MarLEM master course specification has been defined in this document. This set will be further refined in the training plan specification and along all the training planning work-package.

The training design specification has been developed strongly based on the end-user needs, constituting the main guidance to the design phase of the MarLEM master course regarding to provide the proper answer to bridge the gap between identified needs and skills to be developed.

The MarLEM master course concept, approach and structure has its basis in the technical pillar of Strategic Logistics and in the soft skills pillar in line with 21st Century Skills. Technical and soft skills ought to be integrated in the master course in a balanced way aiming at providing state of the art skills allowing the development of the expected competencies.

The MarLEM master course approach and methodology is based on the principles of the Quality Management with particular relevance to ISO 10015 and ISO 21001 International standards.

Regarding to have the involvement of industry and authorities, maritime clusters and port and maritime related authorities will play a decisive role from design phase to validation phase. In this perspective, industry, authorities and universities, will form a knowledge triangle in the port and maritime domain granting the proper alignment of the master course.

The designing and planning of the master course has to be flexible in order to be adapted and adjusted to students/young workers and to professionals already in the workforce. Namely, duration (1 or 2 years), modularity, scheduling and virtual training, balanced with work in the field, are variables to be properly planned and operationalised.

7. References

ISO (2015). ISO 9001:2015 - Quality management systems — Requirements;

ISO (2019). ISO 10015:2019 - Quality management — Guidelines for competence management and people development;

ISO (2018). ISO 21001:2018 - Educational organizations — Management systems for educational organizations — Requirements with guidance for use;

OECD (2016). The Ocean Economy in 2030;

P21 (2016). Partnership for 21st Century Skills.