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Study supporting a possible network of maritime training academies and institutes in the Mediterranean Sea basin

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Abstract

This study aims to provide policy makers with an assessment of the feasibility, added value and available options for promoting cooperation between institutions providing education and training for marine and maritime professions. An overall 355 educational and training institutes have been mapped across 21 Mediterranean countries, both in higher education and in VET. The maritime education and training offer appears rather fragmented and traditional – and does not fully match the requirements of tomorrow's Blue Economy. The cooperation landscape consists of both project-based as well as structural initiatives, with a focus more so on higher education than on VET. Despite the many barriers identified, a strong interest in cooperation and integration exists amongst practitioners – as has been confirmed during five focus group sessions and one validation workshop held in Athens, Barcelona, Genova, Larnaca, Rome and Valletta. The research and subsequent exchanges have led to a 'Passage Plan', consisting of principles for action, and recommendations both for policy makers and practitioners. Most strategic is the recommendation to establish a Forum for Maritime Education and Training in the Mediterranean, and to make use of the Union for the Mediterranean Framework to host this initiative. Another ten recommendations are made for practitioners who wish to engage in such cooperation.

Executive summary

Background and aim of the study

Building on the Integrated Maritime Policy (IMP)[1], the Blue Growth strategy[2] is designed to provide policy makers at EU and sea basin level with a comprehensive, robust and consistent analysis of possible future policy options to support smart, sustainable and inclusive growth from the oceans, seas and coasts. In this context, the supply of a skilled workforce and the related education and training are key in order to maximise the potential of the Blue Economy.

The Declaration for the Promotion of the Blue Economy in the Mediterranean region of the Ministries and other Heads of Delegation, who gathered in November 2015 under the Union for the Mediterranean banner[3] stressed the need for the Mediterranean region to make the best use of the potential of the Blue Economy, to promote growth, jobs and investments. They also highlighted the skills mismatch of the labour force, as well as the slow uptake of clustering and networking, while concluding that regional cooperation and networking are necessary to deal with these challenges.

Against this background, this study *aims to provide policy makers with an assessment of the feasibility, added value and available options for setting in motion and/or reinforcing one or more (international) networks between institutions and organisations providing education and training for the needs of marine and maritime professions*.

Maritime education and training in the Mediterranean: a very complex and fragmented landscape

According to our own mapping analysis, the number of educational and training institutions located in countries bordering the Mediterranean Sea is 355[4], and they are located in a range of 21 Mediterranean countries. A total of 40 % of the mapped organisations focuses on only one Maritime Economic Activity, while the remaining 60 % deliver education to more than one MEA. The focus in education and training in the maritime sector seems to be on the traditional sectors and seafarers, and less so on on-shore subjects. At the off-shore side one sees a very strong sense of pride within the workforce, along with strong international regulations and standards. In some cases these standards prevent institutions to innovate and expand beyond the traditional disciplines.

The mapping exercise and the subsequent research has demonstrated the complexity of maritime education and training in this area due to:

- The variety of maritime economic sectors involved, such as (nautical and coastal) tourism, maritime engineering (shipping, ports, energy sector), coast guard and security (including monitoring) as well as life sciences required for advancing aquaculture, fisheries and biotechnology;
- The geographic diversity and big distances across this large-scale sea basin; the distance between Gibraltar in the west to Beirut in the east exceeds that from Gibraltar to Denmark;

[1] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, An Integrated Maritime Policy for the European Union, COM(2007) 575 final, 10.10.2007.
[2] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Blue Growth opportunities for marine and maritime sustainable growth, COM(2012) 494 final, 13.9.2012.
[3] http://ufmsecretariat.org/wp-content/uploads/2015/11/2015-11-17-declaration-on-blue-economy_en.pdf
[4] Organisations for which it was not possible to determine the MEA were excluded

- The differences between EU and non-EU countries, not only in terms of socio-economic development but also in the means and feasibility of traveling (e.g. visa requirements) and formal and informal recognition of skills and qualifications;
- The coverage of both higher as well as vocational education systems, both of which are different in terms of set-up and remit;
- The number and diversity of institutions involved; varying from mainstream universities and dedicated maritime academies to sectoral organisations and employer's organisations, public authorities, ministries, employment agencies, etc. that provide education as part of their activities;
- The national specificity of educational systems, including the differences between public and private sector involvement<. In some countries, maritime education and training is primarily provided by the state, while in other countries the private sector plays a key role, with all gradients in between. Since the mixture of stakeholders involved in the provision of education and training is highly dependent on the national education system, it is important to take such differences into account when attempting to build cooperation.

The maritime education and training offer appears rather traditional – and does not fully match the requirements of tomorrow's Blue Economy

Existing curricula offered in the Mediterranean sea basin are rather traditional and conventional, and are not necessarily adjusted to the needs of the modern Blue Economy. As a result, commercial initiatives have been taken not only within the region but also outside the region [5], in an attempt to close existing gaps. Although such opportunities are helping to respond to the needs of the maritime economy, mostly so in the area of shipping, they do not help with building a modern, state-of-the art maritime education and training offer in the region, not with developing skills kin smaller but upcoming blue sectors.

A landscape consisting of both project-based as well as structural initiatives

The study shows that there is no central database with an overview of all providers of training in the Mediterranean in the maritime sector. Without such a database, it is difficult to build an overview of all such education and training initiatives and of cooperation in the Mediterranean. Our own inventory has pointed to fourteen networks operating in the Mediterranean in the field of maritime education and training. Of these, several are EU-funded and project-based and most of them have come to a close already: AQUA-TNET -the European Thematic Network in the field of aquaculture, fisheries and aquatic resources management) and Vasco da Gama are prominent ones. Many of the project-based initiatives identified depend largely on EU funding mechanisms as the source for their set up – which provides challenges with regard to sustainability.

Other, more structural bodies include the European Coast Guard Functions Forum and the MariFuture - European Platform for Maritime Education, Research and Innovation – both initiatives have been described as part of the case study derived from the Genoa case study. They are important initiatives to take into account, however they appear not to be specifically geared towards the broader maritime education and training offer in the Mediterranean. MariFuture appears to focus mostly on commercial offering and has only weak links with public education institutes.

[5] See http://www.marifuture.org/Partners.aspx

Cooperation is more focused on higher education – VET is less covered

Existing international networks are mainly active at the higher end of education, with VET hardly being present. Higher education institutes (universities) tend to have a strong international network that focuses on new topics. However their prime focus for cooperation often lies more in research than on education: offering training courses is not their key focus. This inhibits transfer of knowledge and innovation to enterprises.

Networks or more stable institutional cooperation are also mapped and examples involving a wide array of themes can be evidenced in the Mediterranean sea basin, involving mainly higher education entities (with very few VET providers).

Although most of the training offer concerns VET, the international cooperation in VET is not as strong as in higher education – which is more internationalised already. There are multiple reasons for this, and the fact that skills and qualification recognition is more advanced in the higher education (the Bologna process) is certainly one of them.

A number of training institutions have a strong international network and some provide training as part of global training initiatives – following international standards. Private institutions are often better capable to cooperate with enterprises. Also the prime focus on certification and traditional skills may inhibit innovation.

Maritime education and training is expensive – due to high capital costs

Overall, maritime education and training involves high capital costs – required for the necessary infrastructure including teaching materials, training simulators, laboratories, vessels, etc. The financing structure for the sector is vulnerable. Longer term investments are needed as the current training offer is often outdated and not following pace with the technological developments in the sector. Cooperation offers concrete opportunities for economies of scale, sharing and pooling of resources.

Nevertheless, a strong interest in cooperation and integration exists

Despite the complexity, the interest in cooperation amongst Mediterranean maritime education and training providers appears strong. A wide range of similarities, synergies, challenges and concerns has been identified, and confirmed the willingness of stakeholders to cooperate on overcoming these. The strong interest in cooperation was confirmed by the willingness and ability of five organisations in the region to co-host the focus groups, and to do so at high professional standards. It has also been confirmed by the strong interest from participants to join such focus groups – despite long travel distances and time investments required. This can be considered an important indicator for the feasibility of any follow-up activity.

Cooperation efforts are complicated by a number of issues

Efforts to cooperate in maritime education and training are often faced with a range of barriers, of a structural and/or practical nature:

- Variation in the national characteristics of maritime education and training, including its public or private nature;
- Mutual recognition of qualifications. Maritime education systems responds to a national system of academic job titles and academic reconnaissance. For example, a person that studies in the UK will be granted with a British academic title that will not be recognised in France, whereas in France, North African titles are more recognised as they are more or less similar to the French system;

- Insufficient capitalisation on past experiences. For example, choice of a wrong cooperation framework and underestimation of the sustainability issue;
- Lack of understanding and interest in the maritime sector among mainstream institutions and education organisations;
- Financial barriers which do not allow the continuation of cooperation unless new funding schemes are made available; difficulties in ensuring the continuation of project-based networks of collaboration in the long-term.

Weak cooperation between North and South parts of the basin

From our analyses of existing education networks it is clear that the linkages between educational institutions with the countries on the opposite side of the Mediterranean sea basin are still weak and in many cases non-existent. Many obstacles exist also in terms of admission of students and visa requirements. There is a need for specific programmes that foster mobility with third countries in education and research, as well as common methods for the recognition of qualifications in the maritime sector. This requires full confidence in the capacities, employability and performance of workers from across the sea basin.

Feasibility of promising existing and emerging bottom-up initiatives has been explored

This project has identified and assessed various existing and emerging initiatives and acted as a facilitator in their further development and visibility. Existing initiatives that have been highlighted were VET On Board ('Marinate' the nautical training offer, emerging from the focus group in Barcelona, Spain) the Malta Maritime Forum and Malta Marittima, based on the focus group in Valletta, Malta). New initiatives that have been actively facilitated are the Blue Career Centre for the Eastern Mediterranean (based on the focus group in Larnaca, Cyprus) and the Blue Biotechnology & Aquaculture Postgraduate Course for the Central-East Mediterranean basin, based on the focus group in Athens, Greece.

A 'Passage Plan' – principles for action

Based on the analysis to date, and taking into account the experiences gained with maritime education and training cooperation in the Mediterranean, a number of principles can be formulated which serve as guidance for future action by all stakeholders:

- *Principle 1: A need to increase attractiveness, modernisation and innovation* – as the needs of the maritime sector are rapidly evolving;
- *Principle 2: Cooperation according to the triple helix is needed* - both educationan/training institues, government and the private sector are required;
- *Principle 3: Think 'global' and act 'local'* - apply international standards and practice nearby;
- *Principle 4: Capitalise on existing or past experiences* - and learn from what has worked and not;
- *Principle 5: Establish sustainable forms of cooperation right from the start* – cooperation requires trust to be built up – which is more than 'stop and go'.

Recommendations for EU, international and national policy makers

Building on the above principles, a number of recommendations are made to EU, international and national policy makers:

- *Recommendation 1: Establish a Forum for Maritime Education and Training in the Mediterranean* – which acts as a flexible umbrella;
- *Recommendation 2: Utilise the Union for the Mediterranean Framework* – now that is has been mandated through the Declaration on the Blue Economy;

- *Recommendation 3: Build on existing cooperation – from the Mediterranean and beyond*; Good initiatives deserve recognition and acknowledgement – especially North-South cooperation;
- *Recommendation 4: Promote the visibility and take-up of existing programmes, initiatives and funds*; dare to put in the spotlight those initiatives which deserve to be shared across the sea basin and beyond;
- *Recommendation 5: Tailor mainstream programmes, funds and initiatives to the maritime education and training needs in the Mediterranean* - especially as many funds are not open to non-Member States, or where Mediterannean actors are not well placed to compete with EU-wide competition.

Recommendations for maritime education and training professionals

Complementary to the above-mentioned recommendations for policy makers, the following recommendations are made for practitioners:

- *Recommendation 1: Align quality standards across the Mediterranean*; as there is a need to earn credits in education;
- *Recommendation 2: Target real needs* – that are future-oriented and that respond to real challenges and problems;
- *Recommendation 3: Carefully establish the right framework conditions* – take the time to build up the trust and to do so step-by-step;
- *Recommendation 4: Pool resources* – make joint use of expensive equipment, such as maritime simulators or training ships;
- *Recommendation 5: Build on experiences gained* – take into account lessons learnt from previous initiatives and do not re-invent wheels;
- *Recommendation 6: Engage with the private sector* – as they know best what the labour market requires, and as it helps to create job opportunities;
- *Recommendation 7: Develop Blue Career initiatives* – that promote overall awareness and attractiveness of maritime professions to youngsters;
- *Recommendation 8: Create joint programmes and summer schools* – summer schools are a good starting point, and from there move to joint Bachelor's or Master programmes;
- *Recommendation 9: Explore E-learning opportunities* – especially as the costs for covering travel distances across the sea-basin are high, and as E-learning offers opportunities to take part in training outside the Mediterranean;
- *Recommendation 10: 'Marinate' existing VET curricula* – make use of existing and established VET training offers, but ensure that it is adapted to the specificities of the marine environment.

1 Introduction

1.1 Background to the project

Building on the Integrated Maritime Policy (IMP)[6], the Blue Growth strategy[7] is designed to provide policy makers at EU and sea basin level with a comprehensive, robust and consistent analysis of possible future policy options to support smart, sustainable and inclusive growth from the oceans, seas and coasts. In this context, the supply of a skilled workforce and the related education and training are key in order to maximise the potential of the Blue Economy.

Recent studies[8] reveal a heterogeneous and unclear picture as far as qualification and training systems are concerned. In the case of port workers, for instance, the data collected proved to an extent incomplete, ambiguous and/or inconsistent, while the promotion of employment for seafarers and fishermen represents a first important step for the Mediterranean countries. The same applies for other marine and maritime jobs, demonstrating a clear need for enhancing the status/attractiveness of these careers, by supporting skills development and adapting and promoting education and training in maritime activities. This is for instance the case for priorities relating to business growth, such as access to finance for marine aquaculture and tourism, processing for activities related to the use of marine resources (fisheries, marine aquaculture and biotechnologies), marketing and communication for fish and seafood products and for innovative high-quality tourist offer, or technology transfer (e.g. traceability in the food industry, fuel efficiency, eco-tourism, desalination, etc.), among others.

As highlighted in the FEMIP Conference held in April 2013, "networking across training institutes may be conducive to improved career attractiveness through better matching of training offers to the needs of the sector and more harmonised training approaches in the region". This concept was also stressed by the European Investment Bank[9], according to which “the creation of a Mediterranean Academic Network could be a first domain leading to short-term results” in a path towards the enhancement of regional cooperation through “the creation of structured working relations and networks linking stakeholders in the Mediterranean coastal countries”.

More recently, new momentum has been given to maritime education and training in the Mediterranean through the Declaration for the Promotion of the Blue Economy in the Mediterranean region of the Ministries and other Heads of Delegation, who gathered in November 2015 under the Union for the Mediterranean banner[10]. Ministers and national representatives of the 40 member countries stressed the need for the Mediterranean region to make the best use of the potential of the Blue Economy, to promote growth, jobs and investments. They also highlighted the skills mismatch of the labour force, as well as the slow uptake of clustering and networking, while concluding that regional cooperation and networking are necessary to deal with these challenges.

[6] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, An Integrated Maritime Policy for the European Union, COM(2007) 575 final, 10.10.2007.
[7] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Blue Growth opportunities for marine and maritime sustainable growth, COM(2012) 494 final, 13.9.2012.
[8] http://www.marleanet.com/arch/anx/Marleanet_presskit_GB_6_july_2011.pdf
[9] Feasibility Study for the Mediterranean Sea Maritime Development Cooperation, http://www.eib.org/attachments/country/femip_study_maritime_cooperation_en.pdf
[10] http://ufmsecretariat.org/wp-content/uploads/2015/11/2015-11-17-declaration-on-blue-economy_en.pdf

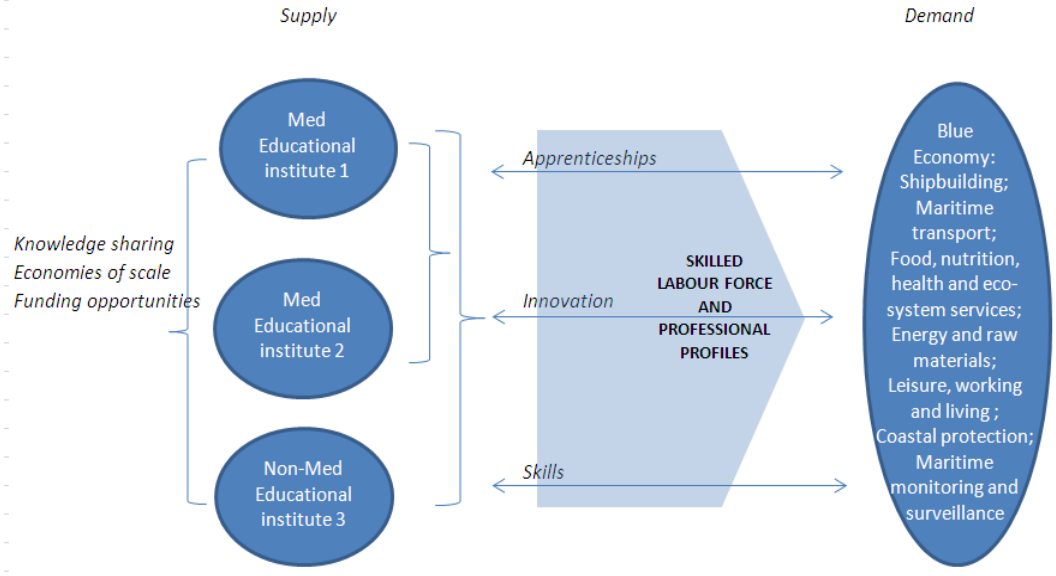
DG MARE has succeeded in introducing Blue Growth as a single category in EU research programmes, in EU programmes dealing with territorial cooperation and in programmes dealing with non-EU countries (IPA or ENPI)[11]. Other initiatives such as ERASMUS+, ESF-funded projects, Horizon 2020 and twinning projects are reference tools and frameworks to address the need for skills in the maritime economic sectors.

Nevertheless, further progress is needed in terms of education and training cooperation. The 2012 European Maritime Day conference highlighted the need to strengthen relations between maritime businesses and the training sector in order to ensure competency and education aligned with business needs. A fragmented view of the maritime business sector by universities and training centres was identified and increased cooperation between and specialisation of educational institutions was recommended. The outcome of the project was the recognition of the need to develop and improve training, education and attractiveness of maritime professions.

It is therefore of great importance to foster the professional profiles in the marine and maritime sectors through an efficient and effective education and training provision and schemes. Cooperation between the providers as well as industry professionals from different countries and sectors could represent a possible response to this heterogeneity.

The relationship between the educational and training infrastructure and the Blue Economy is key in this process. It is characterised by a number of interactions and exchanges between the skills supply and demand sides. These can generate virtuous effects in terms of the Blue Economy and jobs creation, as represented in Figure 1-1.

Figure 1-1 **Network of maritime education and training organisations: analytical framework**



Source: Ecorys

[11] Support activities for the development of maritime clusters in the Mediterranean and Black Sea areas.

At the supply side, maritime education and training institutes are providers of skilled staff for the Blue Economy. In addition, Blue Economy companies also ensure learning opportunities for students through for example apprenticeships or internal training.

In order to stimulate economic growth, education and training providers need to ensure the knowledge and skills that support the sector. This is not easy, since the demand from the economy and labour market can change rapidly, while education and training institutions need a long time to adjust. Curricula and testing systems have a long life cycle: changing a curriculum or developing a new programme can take years. Cooperation between maritime education and training institutes, as well as with companies operating in the field of the Blue Economy, can increase this flexibility and adaptability of curricula and thus ensure a higher relevance of the educational offer for the labour market. At the same time this cooperation can feed new ideas and knowledge into companies, promoting the quality of training and education to meet the industry's needs and improving networking among different types of actors.

More specifically, strengthening the supply side of skills and knowledge provision in the marine and maritime sectors can have a number of potential benefits, such as:

- Networking and partnerships can strengthen the overall performance in terms of skilled staff, apprenticeship opportunities and innovation, ensuring effective remedies to skill shortages;
- Networking of maritime education and training providers can improve efficiency, in terms of knowledge sharing, economies of scale and access to funding opportunities;
- Cooperation with leading educational institutes can strengthen the network and promote internationalisations initiatives, e.g. increase the hub function and centres of excellence;
- Networks of providers can influence the national and European funding priorities when it comes to education and training;
- Stronger cooperation through education and training networks can contribute to increase the attractiveness of the sea basin and to better position it in a broader context (i.e. Europe, and globally);
- Networks among different types of actors, including local governments, can bring increased innovation and modernisation of the education and training offer, to ultimately allow for an adaptation of the workforce to the needs of the maritime industry.

Therefore, supporting the provision of education and training relevant to the marine and maritime professions appears to be key for the Blue Economy.

1.2 Purpose of this study

This study *aims to provide policy makers with an assessment of the feasibility, added value and available options for setting in motion and/or reinforcing one or more (international) networks between institutions and organisations providing education and training for the needs of marine and maritime professions*.

In order to realise this aim, the study:

- Gives a comprehensive overview of the institutes providing education and training related to the marine and maritime professions in the Mediterranean, as well as of the existing and potential cooperation and networks between them – and with other relevant actors outside the Mediterranean;

- Analyses the existing marine and maritime education and training offer in the Mediterranean and its relevance to the enhancement of employability and competitiveness of the main maritime and marine sectors in the region, identifying possible gaps in terms of education and training supply with respect to the professional profiles required in those sectors – both from a geographic and a sectoral angle;
- Brings together local stakeholders to discuss issues regarding the marine and maritime education and training offer at an institution, network and sector level;
- Develops a good understanding of the main challenges, opportunities and added value related to the creation or enforcement of networks between maritime education and training institutes, taking into account existing initiatives;
- Assesses the possible implementation of education and training networks in, across and beyond the Mediterranean region and for the relevant maritime sectors;
- Increases the visibility of marine and maritime vocational and professional education and training in the Mediterranean and raise awareness on their relevance to the Blue Economy in the Mediterranean region;
- Identifies the drivers to be strengthened, barriers to be removed, and scope of the actions to be supported for the promotion and/or reinforcement of such networks; and
- Develops a strategy or roadmap for creating and/or reinforcing such network(s) at a cross-national and cross-sectoral level , including operational guidelines for creating, reinforcing and supporting the functioning of a network or networks between the providers of vocational and professional education and training, and the identification of complementary activities to promote a qualified and skilled labour force in the maritime domain.

1.3 Methods and approach to the study

For all tasks, our approach has been inspired by the principles of targeting, combination of top-down and bottom-up, innovation, connectivity and visibility. As a starting point, we mapped and classified existing institutes and organisations providing marine and maritime vocational and professional education and training as well as existing formal and informal networks and co-operation frameworks. Much information was already available in a number of sources, such as the databases of EU and international initiatives and programmes (i.e. Horizon2020 research programme, European Territorial Cooperation), existing reports and databases published and monitored by relevant institutions (i.e. CEDEFOP, ETF), outputs of international projects (for instance, funded through the 7th Framework Programme).

The approach adopted to carry out the **mapping** was twofold: a so called ‘top-down’ approach was followed to systematise already available information in order to take the most of the already available researches and information, to ensure efficiency and effectiveness as well as to identify the possible information gaps in this fragmented landscape. In this context, we identified relevant public and open access databases related to education and training, public and open access databases related maritime institutions as well as EU databases.

As only a fraction of these linkages are relevant for the maritime sector, a bottom-up complementary mapping phase was carried out by local experts on the ground through focused research at national level to fill the information gaps deriving from the previous steps. This activity also included the identification of key maritime education and training actors, as well as regional and national governments.

While both approaches used in the mapping have resulted in an overall inventory of relevant vocational and professional education and training organisations as well as of their international networks, they have helped creating a considerably rich database of stakeholders' contact details which were later used for consulting with stakeholders on the ground across the whole sea basin.

The stakeholder consultation phase consisted of a **survey** followed by **targeted interviews**. It was aimed at further testing preliminary results, collect information to assess which Maritime Economic Activities could best benefit from the promotion and/or reinforcement of networks and identify the benefits, bottlenecks and added value of networking. As a result, the project team positioned education and training cooperation according to the Maritime Economic Activities. Moreover, the identification of which maritime sectors and activities would benefit from the promotion and/or reinforcement of cooperation/networks formed the basis to develop a topic list for focus groups and a selection of potential hot spots.

The field investigations (consisting of focus groups and case studies) form the bridge between the research tasks and the formulation of the roadmap. The interactive nature of focus groups served as feedback on past analysis, helped identify those themes and issues that are worth analysing in the case studies and enabled the identification of the necessary qualitative information for the identification of the potential benefits and bottlenecks of maritime education & training cooperation in the Mediterranean.

The preparation of the **focus groups** has been aligned to the general objectives of the study and, in particular, as well as to the need for confronting the two main points stated by the European Commission:

- Make really obvious the link of the focus groups with specific maritime activities (sectorial approach);
- Involve territories and institutions (also) from the southern Mediterranean sea basin (geographical approach).

The focus group selection has been based on the comprehensive analysis of the actors and networks that were mapped under task 1 of the study, as well as on the feedback and ideas collected from stakeholders through the survey and the targeted interviews.

With all the above, the following selection criteria for the focus groups have been applied:

1) *Geographical balance* across sub-sea basin;
2) A mix of traditional and emerging *Maritime Economic Activities;*
3) *Networks and cooperation:* attention was paid to both existing networks as well as new initiatives;
4) *Type of actors.*

Finally, an important factor has been the willingness and ability of local organisations to act as co-host for the focus group. Such willingness and ability has been considered an important indicator for the feasibility of any follow-up activity. The integral focus group reports have been included in the separate Annex report (Annex 7).

Table 1-1 Overview of Focus Groups

Location	Geographical balance	Maritime Economic Activities	Topics	Target groups (Networks/type of actors)
Barcelona	West	Nautical tourism/cruise/yachting	The role of maritime clusters as to promote synergies in the maritime education and training offer	Catalan Maritime Forum, private sector, regional universities (World Tourism Organisation)
Malta	Central	Tourism/shipping	Addressing skills gaps	University of Malta, *EuroMed Permanent University Forum*, Malta College of Arts, Science and Technology, National Commission for Further and Higher Education, Empl and Tr. Corporation, Chamber of Commerce, Employers Association
Larnaca	East	Shipping/Offshore energy	International cooperation in maritime training and integrated approaches	*Maritime Institute for East Med*, Arab Academy for Science, Technology & Mar. Transport, Piraeus-based actors
Athens	East/Adriatic-Ionian	Aquaculture and Blue Biotechnology	Building Skills for Blue Biotechnology and Aquaculture	*National & Kapodistrian University of Athens* - Higher education providers in the area of life sciences from Eastern Mediterranean and Adriatic-Ionian region
Genoa	West	Maritime security and safety	Exploring cooperation opportunities in the areas of security and safety	University of Genoa, Coast Guard Safety and Security Training center, Merchant Navy

The five **case studies** aimed at providing ideas and initiatives for addressing some of the challenges raised during the focus groups. In this sense, they include guidelines for the establishment and reinforcement and functioning of several networks of maritime training and education in the region that have been identified. These case studies have both a prospective and retrospective character: they include relevant experiences and lessons from other initiatives and incorporate these in the initiatives discussed.

The choice of the case studies has been made in conjunction with key participants from the focus group, with the aim to elaborate the ideas presented. These key participants have also made available background material; additional interviews and exchanges have taken place, and the draft case study has been reviewed by focus group representatives as well[12]. Due to this bottom-up research process, the formats, length and scope of the case studies vary (See separate Annex report, Annex 8).

Shortly after the development of case studies, around 23 experts, stakeholders and policy makers from the Mediterranean, as well as representatives of relevant education and training maritime network organisations gathered in Rome in a **validation workshop** to fine-tune findings, exchange best practices and develop emerging recommendations and future actions of a 'Passage Plan' for maritime education and training in the Mediterranean. In addition to a limited number of EC representatives and core team members, key participants to previously held focus groups were invited together with a few new stakeholders whose opinions and views were considered relevant for the effective finalisation of the study (the minutes of the meeting can be found in Annex 9 of this report)

Fruitful interactions and exchanges have constituted the basis for validating principles for future action included in the '**Passage Plan**'. These have been developed so to serve both as operational guidelines for stakeholders on the ground, as well as policy recommendations for the European Commission and relevant international organisations.

1.4 About this report

This Report is structured as follows:

Chapter 2 provides the validated findings from the background research, including a comprehensive mapping of the institutes and existing networks and their analysis. These findings have been subject of validation in the 5 focus groups that were held in the period November 2015- January 2016 and corrected afterwards

Chapter 3 provides a synthesis of field investigations in Barcelona (Spain), Valletta (Malta), Larnaca (Cyprus), Athens (Greece) and Genoa (Italy), as well as subsequent follow-on case study research and a number of promising initiatives:

Chapter 4 provides conclusions and recommendations and does so in the form of a 'Passage plan' for both policy makers as well as practitioners. Taken together, they provide a basis for support towards existing and future maritime education and training initiatives in the Mediterranean. The conclusions and recommendations are based on a validation workshop with experts, stakeholders and policy makers held in Rome on 22nd April 2016).

A separate Annex report has been prepared bundling the full results of the mapping, survey as well as the integral focus group reports, case studies and the minutes of the validation workshop held in Rome on 22nd April 2016.

[12] At the time of writing, a number of comments are still pending. They will be processed in the subsequent deliverables.

2 Overview of the maritime education and training offer and existing cooperation

2.1 Maritime Education and Training offer in the Mediterranean

2.1.1 Form, type and level of education and training

In the context of this study, the main types of learning provision to be analysed are:

- Vocational education and training (VET)[13] referring to a learning process of education and training aiming at equipping people with knowledge, know-how, skills and/or competences required in particular occupations or more broadly on the labour market. Special attention will be paid to the accredited VET programmes that are officially recognised and approved by the relevant legislative or professional authorities following assessment against predetermined standards;
- Higher education corresponding to all types of courses of study, or sets of courses of study, training or training for research at the post-secondary level which are recognised by the relevant national authorities of a participating country as belonging to its higher education system[14].

Since the education systems vary widely amongst countries, there is a need to use a standard classification to identify the type and levels of education provided by institutions.

As regards the levels of education provided by institutions, existing classifications of educational institutions as described in the International Standard Classification of Education (ISCED)[15] constitute the reference to define different education levels. Mapping tables exist for most countries in the world that clearly link the national systems to international ISCED standards[16]. The European Tertiary Education Register (ETER) also uses ISCED (5 until 8).

It is important to note that this standard classification is mainly used by policy makers and central agencies collecting data about schools. However, it is not a common language that educational institutions use in their marketing, or public presentation. Therefore in many cases we had to estimate the level of education provided based on the information that is publicly available. In the survey results, the institutions were specifically asked to rate their levels.

Results from mapping existing institutions

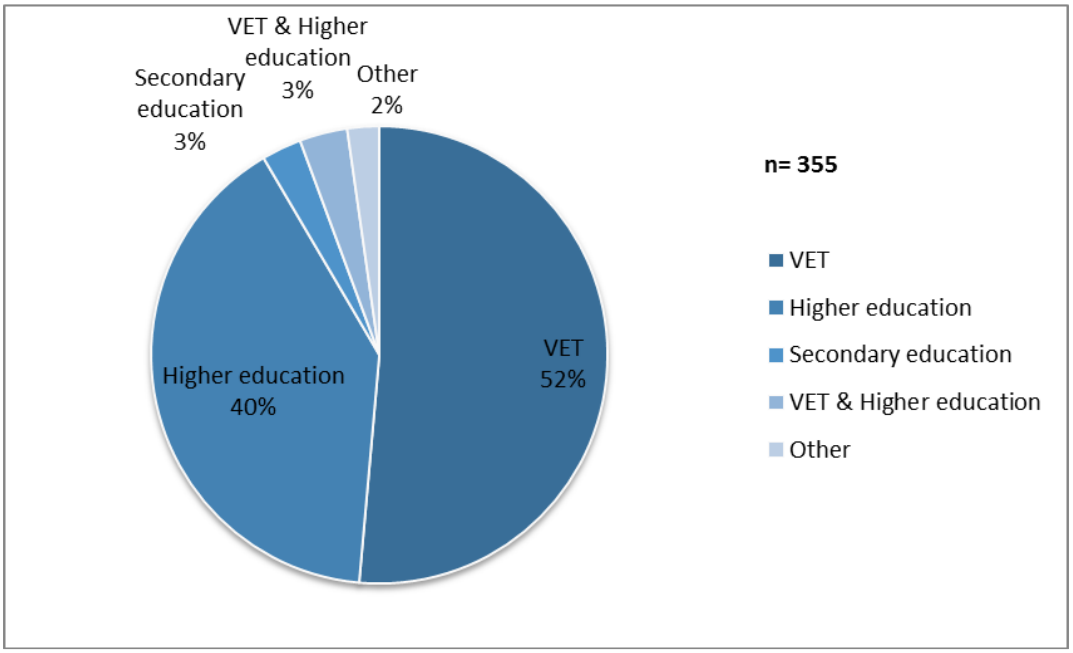
Based on the mapping of institutions offering maritime and marine related programmes we identified a total amount of educational and training institutions located in countries bordering the Mediterranean Sea is 355. The main type of education provided by educational institutions consists of vocational education and training (VET) followed by higher education. The educational institutions are mostly recognised as VET's (46 %) and higher education is mostly provided by universities (37 %). The other types of institutions consist mainly of private or public authorities.

[13] CEDEFOP,Terminology of european education and training policy - Second edition (2014) http://www.cedefop.europa.eu/en/publications-and-resources/publications/4117
[14] http://eacea.ec.europa.eu/erasmus_mundus/tools/glossary_en.php
[15] Developed by the United Nations, this is the most commonly used classification system (also by Eurostat)
[16] http://www.uis.unesco.org/Education/ISCEDMappings/Pages/default.aspx

Table 2-1 **Types of education provided**

Type of institutions		Type of education	
VET	167	VET	182
University	131	Higher education	142
Private authority	19	Secondary education	10
Public authority	12	VET & Higher education	12
High school	8	Other	8
Universities providing VET	7	No information available	1
Research centres	4		
College	3		
Academy	1		
Educational organisation	1		
NGO	1		
No information available	1		
Total	**355**	**Total**	**355**

Figure 2-1 **Type of education provided by educational and training institutions**

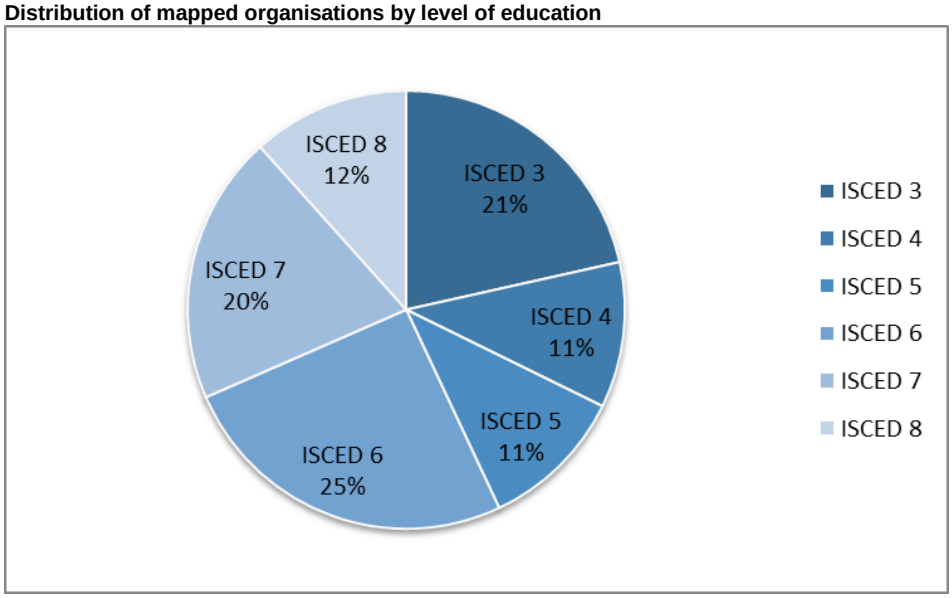


Educational institutions provide different levels of education. ISCED 6 is the level of education most provided, followed by ISCED 3 and ISCED 7. ISCED 6 is provided by 142 educational institutions, ISCED 3 by 120 educational institutions and ISCED 7 by 111 educational institutions. ISCED 1 and 9 are the least provided both only by three educational institutions.

Table 2-2 **Levels of education provided (overall mapping)**

Level of education provided	Percentage
ISCED 3	21
ISCED 4	11
ISCED 5	11
ISCED 6	25
ISCED 7	19
ISCED 8	11

Figure 2-2 **Distribution of mapped organisations by level of education**



Results from the survey

Although the number of respondents of the survey (N=62) is lower than that of the mapping, the results can be considered more reliable since education institutions indicated the levels offered themselves. Nevertheless, the survey results confirm the pattern of the mapping exercise.

Table 2-3 **Levels of education provided (survey sample, n=62)**

Level	Number	Percentage
ISCED 3	2	3
ISCED 4	2	3
ISCED 5	9	15
ISCED 6	17	27
ISCED 7	14	23
ISCED 8	12	19
No specific level	6	10
Total	**62**	**100**

A total of 42 % of the institutions responding to the survey are dedicated to offering education/ training for the marine and maritime sector. Almost half of the institutions offer some courses/ training aimed at the sector. A small percentage indicated that they offer generic courses that could be relevant for the maritime sector.

Table 2-4 **Education and training course offers related and/or applicable to the marine and maritime sectors (n=64)**

	Percentage
Our entire faculty/ institution is specialised in education/ training for the marine and maritime sector	42
We offer some courses/training aimed at the marine and maritime sector	45
We offer generic courses that could be relevant for the maritime sector	3
We currently do not offer courses/training aimed at the maritime sector	3
A combination of the above	2
Other	5
Total	**100**

The number of students enrolled varies widely amongst the institutions: some have a very small number of students (less than 20), whilst 40 % indicate that more that 100 students are enrolled.

Table 2-5 **Number of students enrolled in these courses (n=55)**

Number of students	Percentage
< 20	18
21-50	24
51-100	18
101-1 000	38
1 001-20 000	2
Total	**100**

The mapping table (Annex 1) includes a short description of the types of programmes offered, shows a wide variety of topics covered by the educational institutions. Table 2-6 shows the main focus of courses offered. Maritime transport is one of the key topics, followed by coastal protection (38 %), environmental monitoring (38 %) and offshore oil and gas (25 %). Other offshore development as well as renewable energy is offered by 23 % of the institutes surveyed, followed by fisheries (21 %), shipbuilding (19 %) and yachting & marinas (19 %).

Table 2-6 **Main focus and/or target of education/ training courses (multiple response) (n=53)**

Main focus and/ or target of education/ training course(s)	%
Maritime transport (including port facilities) Deep-sea shipping: International (freight) transport by sea with large vessels or medium sized ships	55
Coastal protection - Protection against flooding and erosion, preventing salt water intrusion, protection of habitats.	38
Environmental monitoring - Marine environmental monitoring is not a clear-cut function. It may cover water quality, temperature, pollution, fisheries etc.	38
Offshore oil and gas - Extraction of liquid fossil fuels from offshore sources	25
Offshore development and exploitation of a variety of renewable energy sources excluding wind, including wave energy, tidal energy, Ocean Thermal Energy Conversion, Blue energy (osmosis) and biomass.	23
Catching fish for human consumption (including processing) - Extracting wild natural resources	21
Shipbuilding - This sector includes building of ships and floating structures, building of pleasure and sporting boats and	19
Yachting and marinas - This activity is strongly interlinked with coastal tourism. It can be defined as coastal tourism in	19
Marine aquatic products - Farming of aquatic organisms, mainly for human consumption (mainly fish and molluscs)	17
Coastal tourism - Shore based sea related tourist and recreational activities.	17
Construction of water projects - This sector includes the construction of waterways, harbour and river works	15
Offshore wind - Construction of wind parks in marine waters, and exploitation of wind energy by generating electricity off	15
Cruise tourism (including port facilities) - Tourism based on people travelling by cruise ship, having the ship itself as	13
Surveillance - Equipment and services used for security purposes in the field of maritime transportation; surveillance of	11
Catching fish for animal feeding (including processing) - Extracting wild natural resources (essentially fish) for animal consumption. The final product is mainly fishmeal and fish oil, which can be used by agriculture and aquaculture. This sector also includes fish processing, wholesale and retail.	9

Main focus and/ or target of education/ training course(s)	%
Blue biotechnology - Using wild and farmed aquatic living resources as precursors of bio-molecules used for high value products (health, cosmetics, etc.). It is about unravelling the potential of the biodiversity of a specific earth compartment for the benefit of the rest of the economy.	9
Marine minerals mining (deep-sea mining) – Deep sea mining of raw materials other than aggregates, including critical materials which have a risk of supply shortage.	8
Agriculture on saline soils - Development of agriculture on saline soils, through improving existing crops or adapting salt tolerant plants.	4
Carbon capture and storage - Caption of CO2 at large emitters and ship these to empty offshore fields and other favourable geological formations for long term storage as a means to contribute to sustainability targets.	2
Aggregates mining (e.g. sand, gravel) - Extraction of marine aggregates (sands and gravels) from the seabed.	2
Securing fresh water supply - Desalination of sea water for fresh water usage (agriculture irrigation, consumer & commercial use).	2
Other	21

Other topics covered that are mentioned are:

- Data analytics over Aquaculture processes;
- Deep-sea ecosystem exploration, Marine Protected Areas;
- Hydrography;
- Marine biology (conservation, genetics, perturbations, ...), Cycles of elements, role of ocean in climate, marine ecosystems functioning;
- Marine education for deck officers leading to certificate of competence for Deck Officer of the Watch (OOW);
- Maritime Spatial Planning;
- Seafarers training (Chief Engineers, Master Mariners, OOW, ...);
- Security;
- Surveys for mapping, oceanography, meteorology.

Highlights from interviews

The interviews served as an additional source, to deepen understanding on how education and training institutions identify the topics and curricula to be developed and offered. As the interviewees work at a variety of institutions and in different contexts, it is challenging to draw conclusions which are valuable for all at this stage. To illustrate the findings from the interviews, we highlight a number of findings below.

Focus on international cooperation should be part of education systems - The *Catalan Maritime Forum,* an organisation related to the Barcelona Boating Industry Cluster, stressed the importance of international cooperation for education. One of the main needs for the sector is the performance of English and other languages. The problem is that Member States still work as "archipelagos", centred in their education systems instead of thinking in excellence and international terms.

Recognition of qualifications can further increase cooperation - The *French Ministry of Ecology* pointed to the issue that maritime education systems respond to a national system of academic job titles and academic recognition. For example, a person that studies in the United Kingdom will be granted with a British academic title that might not necessarily be recognised in France. In France, North African titles are likely to be more recognised as they have been

developed using the French system as a basis. Nevertheless, there is rarely any collaboration occurring between African and French authorities when it comes to education projects. There is a need to create a clear recognition system that links the different academic titles displayed by different national education institutions. This fact limits exchange of students and the improvement of collaboration between organisations.

Several advantages of maritime cooperation - The *Maritime Department of the Italian Ministry of Transport* points to the following advantages of a collaboration at the international level among relevant ministries: 1) Coherence in the provision of similar competences which would allow to significantly reduce unfair competition in the area of education and training; 2) Similar and equivalent degrees to ensure homogenous education and training; 3) The cross-border recognition of certificates and, thus, the free movement of seafarers across countries. In Italy, for instance, a seafarer needs to hold a navigation certificate to be able to work as well as a series of proven qualifications.

Several ideas for topics emerged - Most interviewees had a clear idea on topics that could be further developed as part of curricula in the marine and maritime sector. New innovative fields should be developed, for example in the field of food and dietetics, to develop cuisine of some maritime species that are usually thrown away. Also new activities in the field of fisheries management could be developed. Fish processing companies should understand that the best refrigerator is the sea, and introduce more resource management concepts. Other topics mentioned were:

- Sustainable marine environment management;
- Ship repair and maintenance: electronic mechanics, IT systems;
- Protected fisheries.

2.1.2 *Relevant sectorial activities related to maritime education and training*

For the purpose of this study, a sectorial approach was adopted to identify the main maritime fields in which maritime educational providers operate. Maritime Economic Activities have been grouped according to the following categories:

Table 2-7 **Grouping of Maritime Economic Activities**

Categories	
I.	*1. Maritime transport* is aggregated. Sub-codes *1.1 Deep-sea shipping* *1.2 Short-sea shipping* *1.3 Passenger ferry services* *1.4 Inland waterway transport* are considered jointly, meaning that by assumption all sub-activities are executed
II.	2.1 *Catching fish for human consumption* and 2.2 *Catching fish for animal feeding* are jointly considered as one category ("*Catching fish")*. Therefore by assumption all sub-activities are executed
III.	2.3 *Marine aquatic products* and 2.5 *Agriculture on saline soils* are jointly considered as one category ("*Aquaculture")*. Sub-codes are not considered separately. Therefore by assumption all sub-activities are executed (all cells are ticked with an X)
IV.	3.5 *Aggregates mining* and 3.6 *Marine minerals mining* are jointly considered as one category ("Mining"). Sub-codes are not considered separately. Therefore by assumption all sub-activities are executed (all cells are ticked with an X)
V.	6.1 *Surveillance* and 6.2 *Environmental monitoring* are jointly considered as one category (category 6 is aggregated). Sub-codes considered jointly. Therefore by assumption all sub-activities are executed

Categories	
VI.	A new category *"Other"* has been introduced. It is composed by 2 sub-categories: 7.1 Maritime engineering; 7.2 Marine research.

Based on the results of our mapping, the relevant Maritime Economic Activities[17] have been classified as follows:

Table 2-8 Classification of Maritime Economic Activities

Maritime Economic Activities	
0. Shipbuilding	Shipbuilding
	Construction of water projects
1. Maritime transport	Deep-sea shipping, Short-sea shipping, Passenger ferry services, Inland waterway transport
2. Food, nutrition, health and eco-system services	Catching fish (for human consumption and animal feeding)
	Aquaculture
	Blue biotechnology
3. Energy and raw materials	Offshore oil and gas
	Offshore wind
	Ocean renewable energy
	Carbon capture and storage
	Mining
	Securing fresh water supply (desalination)
4. Leisure, working and living	Coastal tourism
	Yachting and marinas
	Cruise tourism
5. Coastal protection	Coastal protection
6. Maritime monitoring and surveillance	Environmental monitoring and surveillance
7. Other	Maritime engineering
	Marine biology

According to the mapping analysis, the number of organisations engaged in education related to at least one Maritime Economic Activity in the Mediterranean is 355[18], and they are located in a range of 21 Mediterranean countries. A total of 40 % of the mapped organisations focuses on education targeting only one Maritime Economic Activity, while the remaining 60 % deliver education relevant to more than one MEA.

Out of 139 organisations that are specialised in only one economic activity, 35 % concentrate their activity on maritime transport only. Almost a quarter (23 %) of institutions operate in the food, nutrition, health and ecosystem sector. However, within this group, almost half of the total entities focus on one single sectorial activity (31 organisations out of 69). This result is not surprising since under this area of specialisation very technical knowledge is often required (e.g. for blue biotechnology) (see Figure 2-3 and Figure 2-4).

On the other side of the spectrum, the organisations that diversify the most are found in shipbuilding, coastal protection and maritime monitoring. Indeed, only 5 out of 151 education providers that operate in maritime monitoring and surveillance focus entirely and uniquely on this area, whereas only 1 organisation out of 42 operating in coastal protection focuses its activity only

[17] The initially proposed classification was slightly modified for the purpose of clarity. An additional category 'Other' has been added based on the mapping results.
[18] Organisations for which it was not possible to determine the MEA were excluded

on that. This seems to suggest that maritime monitoring and surveillance is rather seen as a cross-cutting educational topic. Indeed, this conclusion has been confirmed during the exchanges in the Genoa focus group, where security and safety where also identified as cross-sectorial activities.

Figure 2-3 **Number of Maritime Economic Activities covered by education and training provided in the Mediterranean Sea**

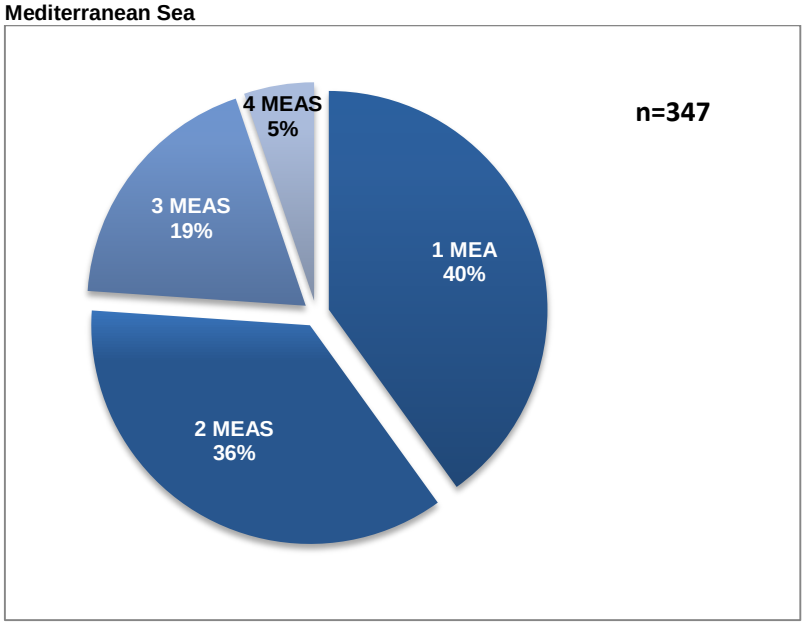
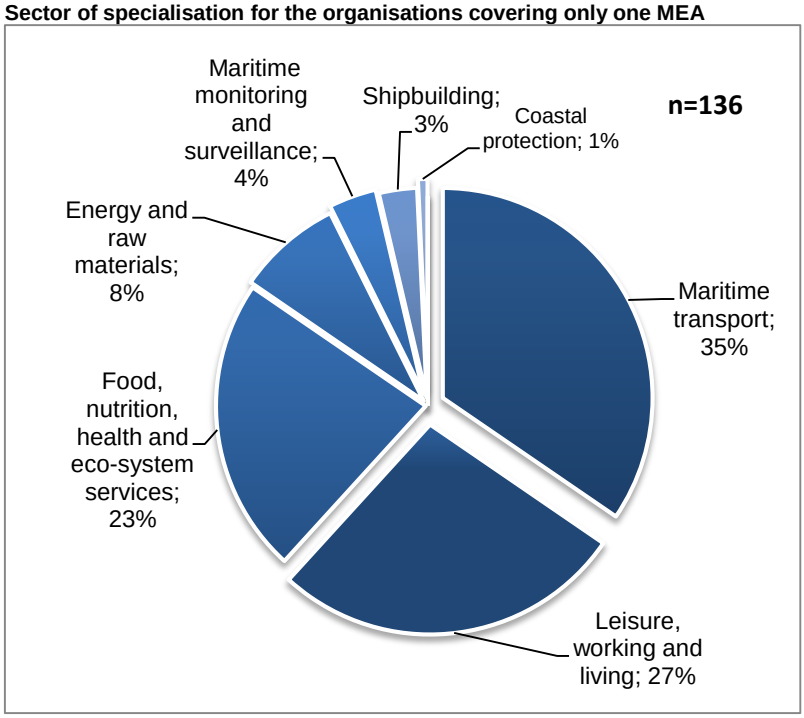


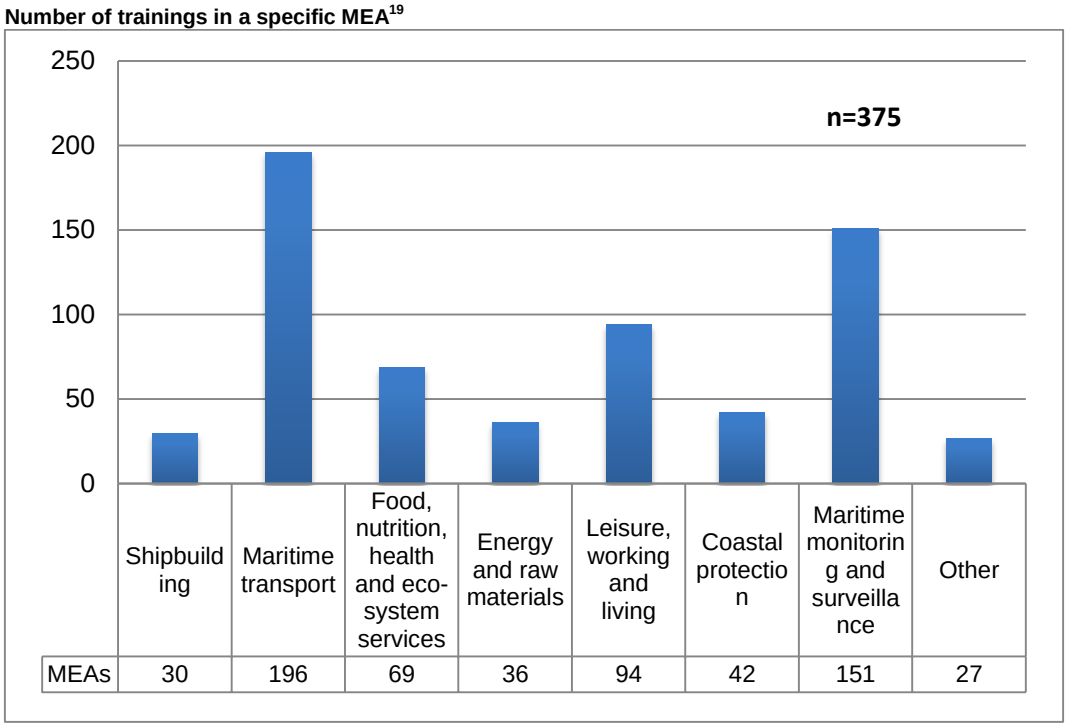
Figure 2-4 **Sector of specialisation for the organisations covering only one MEA**



A total of 27 initiatives fall under the additional category “Other”. This category has been added in order to accommodate the existence of a large maritime sector, taken over by universities, which closely relates to scientific and academic research.

Half of the total number of organisations (51 %) perform some activity related to coastal protection and maritime monitoring. However, as already outlined in Figure 2-54, very few organisations entirely focus on these fields. As expected, the majority of training organisations in the Mediterranean sea basin carry out activities related to maritime transport, in many ways the most 'traditional' maritime economic activity.

Figure 2-5 **Number of trainings in a specific MEA**[19]



	Shipbuilding	Maritime transport	Food, nutrition, health and eco-system services	Energy and raw materials	Leisure, working and living	Coastal protection	Maritime monitoring and surveillance	Other
MEAs	30	196	69	36	94	42	151	27

Before moving forward to the analysis of individual MEAs, it is important to keep in mind that a single education provider rarely choses to specialise on one single MEA, i.e. it offers services that support more than one economic activity. At the same time within one MEA an organisation might also undertake more than one sub-activity. For instance, the total number of trainings that are related to the category of "Food, nutrition, health and eco-system services" is 69, out of which 93 % refer to Catching fish, and 91 % carries out at least some activity on Aquaculture. In this case, an interesting consideration can be presented: many educational organisations do not concentrate on serving one sub-activity but choose to diversify their range of services.

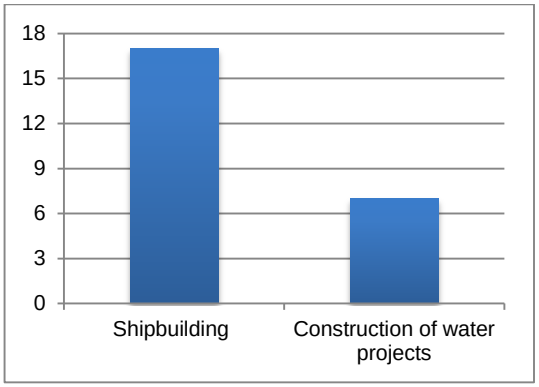
The same reasoning can be applied to other MEAs, such as Leisure, working and living, and Shipbuilding. Especially for the first one, the totality of organisations is involved in Yachting and Marinas and then they are more or less equally split between Coastal tourism and Cruise tourism.

For the category of "Energy and raw materials", the case is slightly different: all the organisations focus entirely on one sub-activity, given the wide diversity of economic tasks that follow under this category. Around 1/3 of the organisations provide trainings and education on alternative sources of energy, such as wind and ocean renewable energy.

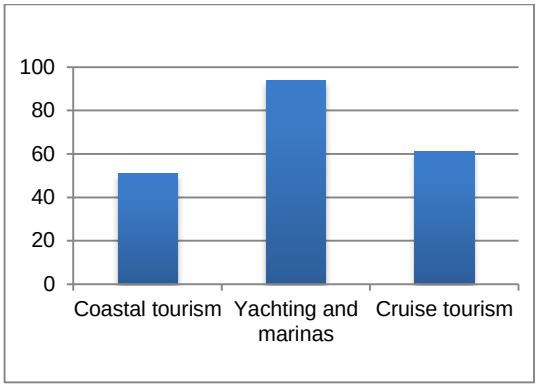
[19] It is important to take into account that each organisation can be engaged in more than one MEA. This implies that the actual sum of the organisations per each MEA exceeds the total number of mapped organisation.

Figure 2-6 **Number of organisations per segment of MEAs**

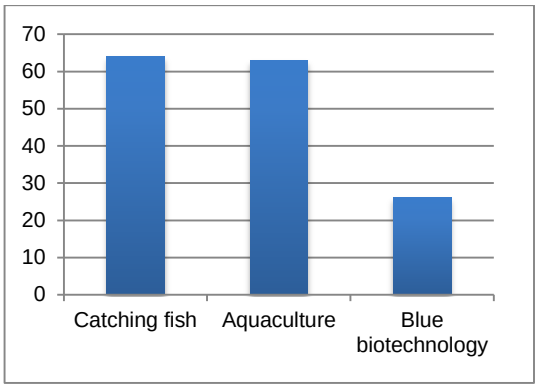
1. Shipbuilding



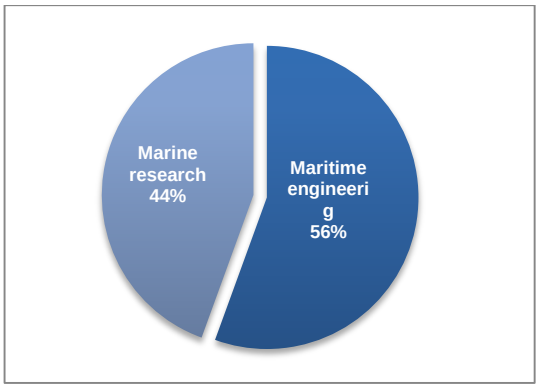
4. Leisure, working and living



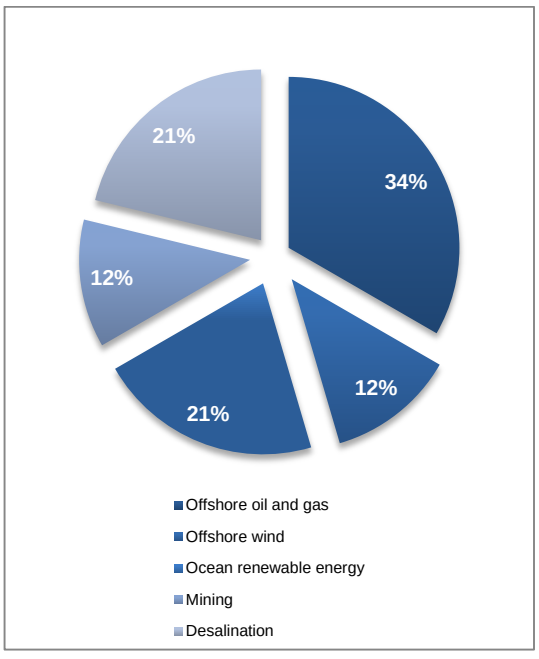
2. Food, nutrition, health and eco-system services



5. Others



3. Energy and raw materials

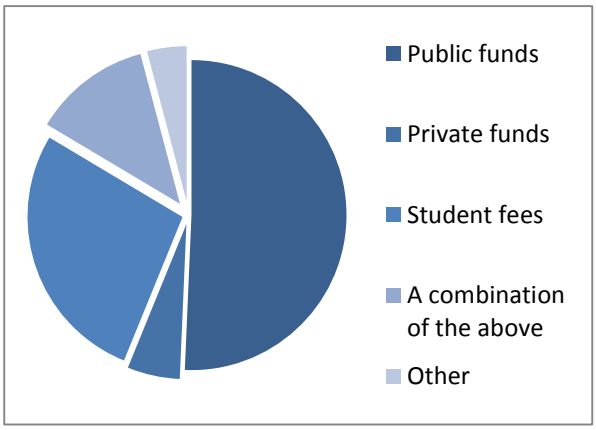


2.1.3 *Actors involved in the provision of maritime education and training*

Different types of actors and organisations can be involved in education and training provision: public authorities, public and private educational institutions, sectorial organisations and employers' organisations. In some countries, education and training is primarily provided by the State, while in other countries the private sector plays a key role, with all gradients in between. Since the mixture of stakeholders involved in the provision of education and training is highly dependent on the national education system, it will be important to understand the specific nature of these settings and education systems in each country[20] for a correct development of this study. Before defining the actors to be mapped and the research approach[21], some clarifications are needed.

In the context of this study, a focus is put on institutions that provide education and training, intended as organisations promoting learning and where individuals learn and develop their skills through the educational, vocational or work context, for the benefit of themselves, one another and the whole organisation, with such efforts and effects being publicised and recognised[22]. However, in reality a wide variety of actors and organisations are involved in the "ecosystem" of maritime education and training. A first indication is the source of funding for education. The survey results show that although public funding is the main source of funding, often a combination of private and public funds exists.

Figure 2-7 **Main sources of funding (multiple response) (n=55)**



Sources of funding	Percentage
Public funds	67
Private funds	7
Student fees	36
A combination of the above	16
Other	5
Total	100

The mapping of institutions and networks also shows a mixture of private and public involvement. The interviews shed light on the advantages of having multiple actors involved in education and training.

Private training providers often have closer linkages with industry – A *private company from Greece* offers a variety of services to the marine and maritime industry, including training programmes. Although they cooperate with educational institutions, they do not so specifically with universities since, in their view, they do not focus on professional careers and professionals. Cooperation with educational institutions is important to raise quality and credibility: it helps attracting more clients. Traditional education institutions tend to be not very receptive to change, and should connect more to the shipping companies. Even though some have obligatory internships as part of their curriculum, there is still a lot which is not covered. Part of the problem is that all institutions need to adhere to the regulations prescribed by the same national ministry. Also

[20] The CEDEFOP country reports, the ETF country profiles and the 40 National Units under the Eurydice network constitute key references for the understanding of the different national contexts and frameworks
[21] The CEDEFOP country reports, the ETF country profiles and the 40 National Units under the Eurydice network constitute key references for the understanding of the different national contexts and frameworks
[22] CEDEFOP (2014), *Ibid.*

international rules on what should be taught in the marine industry can be a barrier to change. A majority of maritime academies have rigid curricula because of these international agreements.

A ***private institution in Greece*** that offers education programmes has a strong link with the maritime industry. Practitioners from the private sector are hired as lecturers and for the mentoring of students. Also, innovative programmes are developed and implemented on the basis of the needs identified within the industry. Students from all over the world attend the Greek private institution's courses, with 35 % of students coming from abroad. There is indeed a strong focus on ensuring the institution's international visibility while providing training that is relevant to the business sector. Indeed one of the success criteria is the international curriculum which opens up interesting professional opportunities.

Researchers tend to be well-connected to international networks but less focused on provision of education – A school of marine sciences in Israel has two international programmes for graduate students, including joint PhD programmes. Several projects are run in cooperation with other countries (for example Greece, Germany, Spain, Italy). Internships with companies are not part of the curriculum, since their focus is on research. There are a lot of connections with other labs (for example in Bremerhaven) and research groups. The ambition is to set up a network for active collaboration among 6 to 7 marine stations from the south-eastern and north-western Israeli region A network is considered very important because a single marine station is not able to monitor the contamination of drinking water. At the moment Israel is experiencing a high risk of contamination of drinking water because of the developments in oil and gas, massive production and poor regulation, little water circulation and risk of war.

A number of networks aimed at modernising education and training exist and can be used to enhance cooperation – The University of Ljubljana, Faculty of Transport and Maritime Transport focuses its education provision on navigation and maritime engineering. Every year, it hosts around 60 to 70 students. The University is member of MarED, an EU-funded programme which aims at modernising and harmonising maritime education in Montenegro and Albania. Members of the network are notably education providers from Albania, Montenegro, Croatia, Slovenia as well as Austria, Spain and Romania. The network also includes the participation of a few port authorities, associations and other public actors. The participation of private sector representatives is limited. Exchanges occur, however they are not systematic. Further involvement would be welcomed, i.e. notably to help students find their first job as seafarers.

The project arose in response to the obligations of the partner countries concerning the ratification and implementation of the latest amendments to the International Maritime Organisation (IMO) regulations related to education and training of seafarers. All necessary changes and harmonisation aim to meet the prescribed international standards to be carried out by 2017, in order to enable the educational and training institutions of the partner countries to maintain their status of internationally recognised maritime educational and training institutions.

Support by a wide variety of actors is required to develop innovative programmes – A new bachelor programme was created in 2009, resulting from a collaboration between the Italian navy and the University of Bari Aldo Moro. The course in Management of the maritime activities is a three-years bachelor programme. Classes are conducted in the buildings of the navy and using navy equipment. The programme follows a twofold objective: from one side, it is aimed at re-launching the stagnant economic and occupational situation in the region; from the other it keeps the focus on a sector that is traditionally central to the local economy. The most developed maritime sector in the region of Taranto is aquaculture: however, no one has ever invested in promoting specific trainings in any sort of maritime activity.

This type of university programme is almost unique in Italy. There are only two similar experiments already existing: a degree programme in maritime and naval sciences at the University of Livorno, in collaboration with the naval academy, and a degree in nautical sciences at the University of Napoli. Before the university course was launched, the programme had already gained consensus from all the neighbouring regions and the industry associations as well, such as Port Authorities, ship owners, shippers, maritime agents, fish-farming and aquaculture associations. The maritime industry warmly welcomed the fact that a university course with practical trainings was introduced. The degree programme is the result of the collaboration of different departments and it is broken down in three different professional paths: a technical-operational, a logistics and an environmental course. This last one is valued as a cutting-edge course and it specialises on Blue Growth, Blue Economy and sustainable maritime development.

2.2 Cooperation in maritime education and training in the Mediterranean

The ultimate goal for any network or cooperation framework would be to make common action more effective and efficient. Networking among education and training providers links entities in the Mediterranean to work on issues of common interest, share good ideas and existing answer to problems, and develop new solutions, facilitating in many occasions a coordinated, strategic and common response. Networks and cooperation frameworks allow to work on issues of common interest, share ideas and existing answers to problems, and develop new solutions related to various fields and scope of activities. They also represent a concrete opportunity to the strengthening education providers' engagement with local/regional authorities and stakeholders from civil society.

2.2.1 Levels and types of cooperation between institutions

A wide array of possible common actions

The common actions carried out as part of the cooperation can assume different forms. Below are some relevant examples identified in the context of the study that need to be taken into account (non exhaustive list):

- Joint development of curricula, teaching materials, methods and modules;
- Joint education and training course offer (in-school or distance learning);
- Structured exchanges of students, teachers, trainers and administrators in higher-education and in vocational education and training institutions;
- Student mobility, including the development of international framework agreements for international mobility;
- Staff exchange;
- Staff education and training;
- Common projects funded by public initiatives;
- Common projects financed by private funds;
- Working groups;
- Creation of mechanism for sharing resources to avoid duplication;
- Development of common infrastructures and equipment for education and training provision;
- Other relevant common actions leading to new tools, products, approaches, projects, etc.

Levels of cooperation and duration: three main types

The common aspect of the mapped cooperation networks responds to the requirements of added value (cooperation is generating something which could not be achieved by an individual institution) and tangibility of results (cooperation is generating products, deliverables, tools, frameworks...).

A cooperation network is defined as a stable collaboration between at least two learning organisations (without preventing the participation of other sorts of actors) actively participating in common education and training actions.

In practice, the levels of cooperation as well as their duration can vary widely, from purely one-to-one informal relationships to full alliances where institutions offer for example joint degrees or market their offerings jointly. One key finding is that a lot of initiatives are project-based and bound in time, while others are more structural. It is important to focus on this dimension as it provides an indication of sustainability as well. While being open to mapping informal cooperation mechanisms provided that they respect both criteria of added value and tangibility of results, the study focuses on more structured cooperation (project-based and institutional cooperation). Pure contracting of work, where there is no active collaboration, is not regarded as cooperation[23]. This being said, it is acknowledged that structured cooperation often starts with a project-based approach.

From the initial mapping analysis carried out, we can classify the intensity of these linkages in three broad categories:

- Informal cooperation between key staff members and institutions;
- Project-based cooperation: cooperation within joint public and private initiatives and (funding) programmes;
- Institutional cooperation based on bilateral/multilateral agreements and/or Memoranda of Understanding (and cooperation taking place in between networks).

The mapping indicates that most of international cooperation in the fields of education and Maritime Economic Activities is project-based. As it can be observed in Annex 2, Programmes such as Erasmus, Socrates or INTERREG provide the financial means and adequate frameworks for education providers to work together, looking for common solutions to tackle similar programmes. In this respect, 67 projects have been identified so far.

In parallel to this intense cooperation in the framework of individual projects, the mapping also shows that a number of different ways of institutional cooperation taking place based on multilateral agreements and/or Memoranda of Understanding do exist in the Mediterranean sea basin.

The study identifies 27 networks or platforms for cooperation between education providers. Out of these 27, 13 correspond to what seems to be stable and well established networks of education entities covering a wide range of thematic areas, not only Maritime Economic Activities. Some of them have been running for a long period of time and are quite well known, such as for example:

- AAU (Association of African Universities);
- EUN (Egyptian Universities Network);
- EuroMed Permanent University Forum;
- CIHEAM (International Centre for Advanced Mediterranean Agronomic Studies – including fisheries).

14 networks operating in the Mediterranean that have Maritime Economic Activities at the cornerstone of their activities have been identified. Examples include:

- AQUA-TNET the European Thematic Network in the field of aquaculture, fisheries and aquatic resources management;
- MariFuture - European Platform for Maritime Education, Research, and Innovation;
- Vasco da Gama – Training for Greener and Safer maritime transport project;

[23] http://glossary.uis.unesco.org/glossary/en/term/2016/en

- European Coast Guard Functions Forum;
- The International Diving School Association.

Some key findings emerge from the realised mapping that deserve to be underlined. Firstly, networks tend to be formed by higher education providers such as universities or research institutes, with VET providers quite absent in the mapping of institutional or network-type of cooperation.

Secondly, VET providers are mapped in many cases as participants in projects, mainly projects co-funded by Life Long Learning Programmes. This is an important finding as VET providers represent the bulk of maritime training offer in a number of countries (see section 2.1.3).

Thirdly, networks identified in the context of this mapping exercise are, in most of the cases, theme-oriented rather than geographically oriented. This means in practice that (international) networks can function at a range of geographic levels, from those including border countries to sub-sea basins, the Mediterranean sea basin as a whole, the EU as well as beyond (e.g. extending to North America, Africa or Asia).

A broad thematic variety

A broad thematic variety Is related to the Maritime Economic Activities and sectors. The thematic focus and purposes of these networks can vary broadly across different Maritime Economic Activities or even tackle a variety of cross-sectorial issues (e.g. the use of English as learning tool, the pooling of resources, addressing common needs, etc..).

Examples include a wide array of thematic topics like, for instance, the Sea Talk Project, with the Centre for factories in the future (UK)taking the lead and involving MED countries, the connectivity project Trainma- European Motorways of the SEaKnowledge Programme, with the Universidad Politécnica Madrid leading or the project MargEngPlus, University of Turku, creating a web-based maritime English Learning Tool.

Key findings on cooperation

In conclusion, the most important key findings on cooperation are:

1) Projects co-funded by EU programmes are the main instrument used by education institutions at the time of carrying out transnational cooperation activities;
2) Networks or more stable institutional cooperation are also mapped and examples involving a wide array of themes can be evidenced in the Mediterranean sea basin, involving mainly higher education entities (with very few VET providers);
3) Transnational cooperation is thematic-oriented rather than geographically focused on the Mediterranean sea context and specificities.

2.2.2 Geographic dimension

Cooperation in education and training can exist at a local, regional, national and international level. Before focusing on the results of the geographic dimension, it is important to bear in mind that this study focuses on international cooperation as cooperation existing between institutions from two or more countries. Specifically, the focus is on cooperation networks involving two or more learning organisations, at least one of which has a Mediterranean country as member. Possible networks of maritime education and training cooperation existing within a single country therefore fall out of the scope of the study. Nonetheless, their identification is important as they could be members of broader international cooperation networks. Hence, it is important to first identify the location of the maritime education and training providers.

Maritime education and training providers: where are they based?

As a starting point, the large Mediterranean sea region can be broken down in three sub-sea basins: Western Mediterranean, Adriatic-Ionian and Eastern Mediterranean sub-sea basin [24] [25].

The mapping of findings confirm that a relatively large number of maritime education and training providers operate from the ***Western Mediterranean*** – over 50 % of all such institutions can be found in this region. Having said this, strong variation between countries can be observed, not only in terms of numbers but also in terms of types of education provided and the legal status (public, private or other). VET education is the dominant type in countries such as Algeria, France, Italy, and Malta. However higher education is relatively important in Spain, and even more so in Morocco and Tunisia. As a corollary, the levels of education are different as well – with France and Italy focusing much more on ISCED level 3, whilst other countries offer relatively more ISCED 5-8 levels. Whilst most institutes mapped focus on students as target population, Italian institutes mapped focus much more on the education of professionals. Furthermore, the Southern shore institutions tend to be much more public in nature, together with those in Malta and Spain, whilst institutes mapped are much more of a private nature in France and Italy. Most institutes focus on one maritime curriculum being offered, however Spanish institutes mapped focus often on two or more. All of the above differences may well hamper current or future cooperation efforts.

Table 2-9 **Number and characteristics of Maritime Academies per country – West Med sub-sea basin**

Country	Number of Maritime Academies	Of which Higher education	VET *)	% public
Algeria	9	1	8	100
France	36		36	19
Italy [26]	64	12	51	22
Libya	2			n/a
Malta	7	1	6	71
Morocco	14	8	5	79
Spain	28	12	14	86
Tunisia	28	20	8	57
Total	**188**	**54**	**128**	**51**

(*) Including training centres

Source: Own mapping analysis

The ***Adriatic-Ionian*** sea basin accounts for the smallest number of maritime education and training providers, only 13 % of the those mapped across the Mediterranean sea basin. Strong disparities leave Albania, Montenegro and Slovenia far behind Italy and Croatia which together account for 86 % of all establishments (more than 50 % being Italian). More generally, Croatia, Montenegro and Albania follow the same structures in terms of legal status with respectively 82 %, 100 % and 100 % of their education institutes being public institutes. On the other bank of the sea, Italy relies for more than two-thirds on private institutes.

On average, VET represents the most common type of education across the region, due to their large presence in both Croatia and Italy. Other countries offer only higher education. The level ISCED 3 takes up the first rank of all education and training offer, once again due to the weight of

[24] See also the "Study to support the development of sea basin cooperation in the Mediterranean, the Adriatic and Ionian, and the Black Sea". Report 4 "Task 5: Mediterranean Sea – Identification of Elements and Geographical scope of Maritime Cooperation" . DG MARE Contract number MARE/2012/07

[25] Gathered through previous studies, such as the studies on Blue Growth and on Maritime clusters in the Mediterranean.

[26] Italian initiatives counted are located on the west-coast

Italy. ISCED 6 and 7 education are provided by all countries. Croatia's offer covers 5 levels (3, 6, 7, 8 and 9). With Slovenia, they are the only countries proposing level 9. The 26 Italian academies teach only one level of training while several Croatian establishments provide their offer up to 3 levels.

Table 2-10 Number and characteristics of Maritime Academies per Countries – Adriatic-Ionian sub sea basin

Country	Number of Maritime Academies	Of Which Higher education	VET*)	% Public
Albania	2	2		100
Croatia	17	5	5	82
Italy [27]	22	4	18	18
Montenegro	1	1		100
Slovenia	4	1		25
Total	**46**	**13**	**23**	**47**

(*) Includes training centres

Source: Own mapping analysis

The mapping findings confirm that about 1/3 of all Mediterranean maritime education and training institutions can be found in the ***Eastern Mediterranean***. However, variation within the East Med appears to be smaller than in the West Med. The focus is much stronger on higher education than on VET, which is the dominant type of education only in Greece. In Turkey, half of the 40 maritime institutes mapped have a higher education profile and half VET. In relation to this, there is a much stronger focus on ICSED 5-8 – which represents over 80 % of all maritime training mapped here. Students are by far the most important target group in the East Med, with only Jordan training providers focusing more on a mix of students and professionals. East Med training providers also tend to be much more public in nature – 2 out of 3 institutes mapped, with a higher degree of private involvement only in Egypt. Thus, whilst acknowledging the barriers to political and institutional cooperation in this sub-sea basin, the maritime education and training institutions mapped demonstrate much stronger coherence than in the West Med.

Table 2-11 Number and characteristics of Maritime Academies per country – East Med sub-sea basin

Country	Number of Maritime Academies	Of which Higher education	VET *)	% public
Egypt	26	16	7	54
Greece	34	14	17	76
Israel	10	8	1	80
Jordan	6	4	2	83
Lebanon	9	9		11
Palestine	5	4	1	0
Turkey	31	24	9	81
Total	**139**	**69**	**50**	**57**

(*) Including training centres

Source: Own mapping analysis

[27] Italian initiatives counted are located on the east-coast.

Table 2-12 Institutional cooperation based on bilateral/multilateral agreements and/or MoUs (numbers of partnerships between countries mapped)

		WEST-MED								ADRIATIC IONIAN					EAST-MED							EU COUNTRIES																					EU BORDER			NORTH AMERICA		ASIA				MIDDLE EAST		AFRICA										Non specified & International
		Algeria	France	Italy	Libya	Malta	Morocco	Spain	Tunisia	Albania	**Croatia**	Italy	Montenegro	Slovenia	Egypt	Greece	Israel	Jordan	Lebanon	Palestine	Turkey	Latvia	Portugal	Rumania	belgium	germany	poland	finland	lithuania	sweden	uk	hungary	denmark	czech republic	slovakia	ukraine	montenegro	russia	canada	us	Japan	China	Korea	vietnam	Syria	Irak	togo	congo braza	rdc	benin	senegal	mauritania	gambia	Ivory Coast	
WEST-MED	Algeria		2	1			1	1	1													1	1																	1					1										1	2
	France																							1																																
	Italy			**4**																																					1	1											
	Libya																																																					
	Malta																																																					
	Morocco		1																					1																							1	1	1	1	1	1	1		
	Spain		1	1																																																	
	Tunisia		5	1			1	1	**1**														1			1												1	1															
ADRIATIC IONIAN	Albania											1														1														1														
	Croatia							1			**2**	1		1							3		1				2	1									1	2															
	Italy																						1			1			1	1																								
	Montenegro																																																				
	Slovenia																																																				
EAST-MED	Egypt		2	2				1							**2**	1										2					1					1				2		2			1								3
	Greece																																																				2
	Israel																																																			
	Jordan		2												3			**1**	1														1							1						1							1
	Lebanon																																																				
	Palestine		2					1																							2									1												
	Turkey			1																				1	1		1		1		2	1		1	1					2		1										

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Table 2-13 Informal cooperation with other institutions and/or networks (numbers of cooperation between countries mapped)

		WEST-MED								ADRIATIC IONIAN					EAST-MED							EU COUNTRIES															NON EU COUNTRIES			others
		Algeria	France	Italy	Libya	Malta	Morocco	Spain	Tunisia	Albania	Croatia	Italy	Montenegro	Slovenia	Egypt	Greece	Israel	Jordan	Lebanon	Palestine	Turkey	Sweden	Netherlands	EU	Finland	Poland	Germany	Finland	Portugal	Lithuania	Cyprus	Belgium	UK	ireland	Montenegro	Russia	US	
WEST-MED	Algeria		1	1																		1	1															
	France																																				
	Italy																							2														
	Libya																																				
	Malta																																				
	Morocco																																				2
	Spain																																				
	Tunisia																																				
ADRIATIC IONIAN	Albania																																				
	Croatia																																				
	Italy																																				
	Montenegro																																				
	Slovenia																																				
EAST-MED	Egypt														1																						1
	Greece		2	3				1								14									1		1		1			1	3	1				1
	Israel			2														1											1							1	
	Jordan																																				
	Lebanon														1															1							
	Palestine																																				
	Turkey																																				

Maritime cooperation: different geographic patterns by sub-sea basin

We carried out an analysis on the geographic patterns by sub-sea basin. The two overview tables Table 2-12 and Table 2-13 provide a remarkable insight into the existing international cooperation between the maritime education and training providers involved. An overall 116 institutional and 43 informal international cooperation have been mapped – thus excluding domestic cooperation but including cooperation outside the sea basin. Below findings deserve further interpretation and exchange, and provide important material for the focus group meetings.

Taken together, just under half of the cooperation initiatives mapped are intra-Mediterranean, whilst almost 1/3 refer to cooperation with other EU countries, and 1/5 of the cooperation is of a global nature (North America, Asia, Africa). This is an important finding, as it raises the question whether the Mediterranean sea basin can be the right or the only level of analysis.

Over half of the institutional cooperations (59 out of 116) involve the *West-Med;* these cooperations focus on the sub-sea basin itself (17), the East Med (11), but also Africa (8, all related to Morocco) and to a smaller extent the EU. Thus the Western Mediterranean sub-sea basin presents a relatively large internal coherence. Historical, functional and linguistic reasons are expected to lie at the source of this pattern.

The *Adriatic Ionian sub-sea basin* is involved in a much smaller number of initiatives (20), of which almost half is with other EU countries outside the basin. The focus on cooperation within the sub-sea basin as well as with other parts of the Mediterranean is rather limited still. An important question especially for the large number of Italian education and training providers is whether they are sufficiently aware of the complementarities that can be found in the region, or whether there is sufficient reason to look for cooperation further afield. The same question can be posed to the Balkan countries involved, which tend to reach out rather fast to broader EU cooperation, possibly in the context of (former) EU Accession programmes.

The *East Med sub-sea basin* demonstrates yet a very different pattern. A total of 49 initiatives are mapped, and only 5 of these refer to the East-Med itself. Much more important is cooperation with other EU countries outside the basin (15 initiatives), followed by cooperation with the West-Med (11). Noticeable is also the cooperation with North America and Asia, however no cooperation with Africa was found. This pattern may reflect the strong historical shipping tradition in countries such as Greece and Turkey, but it can also point to limited synergies within the region itself.

The formal and informal cooperation patterns mapped show many similarities, however informal cooperation appears to be much stronger when East Med countries are involved.

2.3 Stakeholder's perspectives – results from the survey

The survey held amongst stakeholders led to a number of important observations and patterns, which were subsequently discussed in the focus groups. The findings below have been corrected on the basis of the validation in the focus groups..

Education and training providers' perspectives

By far the majority of institutions surveyed is engaged in such cooperation (84 %); only 16 % does not cooperate with other institutions. About one third (34 %) cooperates with other education and training institutions in their own country and 50 % cooperates at international level. The engagement levels seem to be fairly equally distributed between the sub-sea basins, although

national cooperation is more common in the West Med whilst international cooperation appears more common in the East-Med.

More than half of the institutions indicate that they have structured exchanges of students, teachers and trainers with other institutions. Also joint development of curricula is mentioned by quite a high percentage of institutions (54 %). Frequent actions are also Common projects funded by public initiatives (44 %), Student mobility, including the development of international framework agreements for international mobility (44 %) and Joint use of facilities, research infrastructure, manpower (37 %). Less common are actions focusing on capacity building, such as staff exchange (29 %) and staff training (24%) as well as development of common tools (7 %). Hardly any actions (5 %) are focused on creation of mechanisms to avoid duplication in the training offer.

The public authorities' perspective

To enforce and stimulate cooperation between institutions, public authorities can play an important role. Of those who responded to the survey, 41 % indicate that they promote the further harmonisation of existing education and training systems/frameworks. Also 41 % support education and training providers to participate in cross-border/international projects. Providing tools/supporting for networking (39 %) and promotion of common procedures, guidelines and tools (24 %) are common as well. Creating specific marine and maritime related funding opportunities, accessible to education and training providers, is less common: in total 10 % indicates that this is one of their roles.

Public authorities in all sea basins are involved in collaboration or networking in the area of education and training. Two different sets of activities appear to be practiced. Public authorities in the West Med appear to be most engaged overall, mostly by promoting networking between education and training providers and by promoting the harmonisation in the training offer. Public authorities in the East Med appear to be much more focused on supporting the formation of international consortia of training providers.

Private stakeholders' perspectives

Besides educational institutions and public authorities, private companies were invited to respond as well, and a total of 36 have done so in the context of the survey. Most private stakeholders surveyed are engaged in multiple activities, with the traditional activities (maritime transport, coastal tourism, fishing and shipbuilding) being most frequently mentioned. Other frequently mentioned activities include cruise tourism, environmental monitoring, coastal protection and marine aquatic products. About half (17) of the companies indicate that they are currently involved in cooperation or networking schemes with education and training providers, most frequently so in the West Med. Most common is cooperation through (research) projects and by offering training to students (including internships).

The survey results point to half of the companies indicating that cooperation should be encouraged, whereas there are also companies who do not think cooperation should be enhanced. Most reasons for encouraging such cooperation stems from the idea that the private sector embodies a wealth of practical experiences that educational institutions should make use of – as it will improve the competencies of graduates. The focus group meetings resulted in more pronounced views – as private institutions involved pointed to much stronger needs for cooperation than the survey suggests.

2.3.1 *Is there a mismatch between offer of skills and demand?*

West Med: different perspectives on demand/offer gap between public and private sector

West Med: When asked about the mismatch between offer of skills and demand of the market, 20 out of 26 West Med public authorities point to a gap between the education & training world and the business sector. Conversely, private stakeholders are rather more divided: 50% of respondents agree on the existence of such mismatch, while 8 individuals out of 20 affirm that their company/organisation succeeds in identifying the required skills and knowledge in the region.

When asked to indicate which MEAs suffer from a demand/offer gap, public authorities in the West Med indicated the following: 7 respondents out of 26 pointed towards maritime transport as the sector in the Western Mediterranean for which skills & knowledge do not always meet concrete application (27 %); 3 sectors score the second position, each of them with 19 % of preferences: shipbuilding, marine aquatic products and coastal tourism.

According to the private sector respondents in the West Med, a variety of economic activities does not have access to the desired skills & knowledge in the region. First and foremost, two less-traditional MEAs such as environmental monitoring (25 %) and ocean renewable energy (25 %, hence 5 out of 20 respondents). Furthermore, each of the following activities has been identified by 20 % of respondents respectively: coastal protection, yachting & marinas, coastal tourism and maritime transport.

On the one hand, we can observe a clear difference between public and private actors when it comes to identifying MEAs suffering from a demand/offer gap. On the other hand, the analysis suggests that innovative maritime activities are developing (or that there is a willingness to develop them) but relevant skills and knowledge are difficult to find in the region. As for maritime transport, it is mentioned as a sector experiencing the offer/demand mismatch, although public authorities seem to consider such issues as more critical than private actors. What is more, tourism-related activities are pointed at by both stakeholder categories as activities where offer and demand do not meet.

Could cross-border networks in the area of education and training support the offer/demand match for the above MEAs? Public actors in the West Med seem to suggest that maritime transport, and, to a lower degree, marine aquatic products, could benefit from the creation or reinforcement of international networks of cooperation. Thus, the need for such cooperation appears to be stronger in the traditional maritime economic activities where the training offer is already rather mature.

East Med: a strong skills mismatch – but different perspectives

Participating private actors in the survey (5 out of 6) did not see a skills gap within their respective organisations. However, those participating in the focus groups contested this finding: company representatives, assembled in Chambers of Commerce pointed to a much stronger skills mismatch – and supported the view expressed by public authorities who perceive there to be a much strong skills gap. Notably maritime transport (41 %) and catching fish for human consumption (35 %) were stated to be facing such issues, followed by environmental monitoring (29 %). Public authorities suggested that environmental monitoring and cruise tourism would benefit the most from enhanced international and cross-border collaboration. It is important to bear in mind, however that above views were expressed by only few stakeholders and that such results should be properly discussed and confronted during the focus groups.

Adriatic-Ionian: Public sector sees a need to step up training and networking efforts in environmental monitoring

Answers provided by public authorities and private businesses point to a clear dominance of traditional activities in the region, as well as to the key importance of tourism-related sectors.

Public and private sector seemed to have different perceptions on the skills mismatch. The majority of respondents representing public authorities in the region believe that there is a mismatch in terms of skills and knowledge between offer and demand, particularly so in the area of environmental monitoring and to a lesser extent shipbuilding. At the same time, only half of the private sector respondents believe that there is no particular mismatch between the education & training offer and the business sector.

Overall: public sector perceives skills mismatch to be stronger than private sector

Overall, the survey results seem to generally confirm the already known features of the Mediterranean sea basin, where traditional Maritime Economic Activities such as maritime transport and catching fish for human consumption are predominant. In all three sub-sea basins, stakeholders have highlighted the key role of tourism-related activities, notably of coastal tourism.

The great majority of public authorities in all three sub-sea basins points to a mismatch between offer of knowledge & skills and demand of the business sector. When asked to link such gap to specific MEAs, public and private stakeholders have different views: public actors refer to traditional activities such as maritime transport and coastal tourism. An important exception is environmental monitoring, which seems to emerge as a key activity for the sea basin, however still requiring significant upskilling.

Conversely, private stakeholders affirm being able to find staff with the required knowledge and expertise. Those pointing to a gap still refer to traditional activities, while clearly mentioning an offer/demand gap for MEAs like environmental monitoring, ocean renewable energy and, to a minor extent, tourism-related activities.

Private sector sees only scope for some targeted international network initiatives

Although private authorities point to offer/demand mismatches, cross-border and international networks of education and training do not visibly emerge as key tools to solve the issue. This is particularly the case for traditional sectors such as maritime transport, for which the added-value of networks features only in the Western Mediterranean. In the other two sub-sea basins, environmental monitoring and to a less extent cruise tourism emerge as the two MEAs where cross-border and international networks are expected to benefit the maritime economy.

2.3.2 Benefits and barriers

Survey respondents were also asked what they perceive to be the most important benefits and barriers for cooperation.

Identification of benefits of cooperation

Networks can potentially contribute to some of the following benefits:

1) Understand the current challenges and opportunities, as well as bottlenecks, in order to adapt accordingly;
2) Offer new courses and/or certifications linked to new and growing maritime sectors;
3) Improve the quality of currently offered courses and/or certifications;
4) Harmonise their approaches concerning education and training programmes and certifications;

5) Co-operate with the industry (including possible participation in the networks) to match education and training offers with the marine and maritime sector's needs;
6) Follow the European Qualifications Framework;
7) increase opportunities for learning mobility and participation in exchange programmes, both for students and teachers.

These findings can be further qualified by results from follow-up telephone interviews that were conducted. Firstly, a number of common drivers for networking were identified, including the following:

- Transnational cooperation and networks should contribute to the recognition of international academic titles, cross-border recognition of certificates and, thus, the free movement of international mobile workers, above all for seafarers.
- It should also contribute to bringing more coherence in the provision of similar competences which would ultimately allow to significantly reduce unfair competition in the area of education and training;
- Working transnationally should help to assess similar and equivalent degrees to ensure homogeneous education and training;
- Contribute to stimulate the debate at a European level on the need to invest efforts to develop a European certification system for seafarers, based on the definition of shared programmes and qualifications.
- Networking can eventually mean a general improvement in the value chain in new activities and also an increase in the capacities of small business related to the sea.

But an even larger number of barriers exist

Interviewees were also consulted on the main obstacles and challenges to be confronted by transnational cooperation and networks.

A number of challenges were identified, the majority of them related to lack of funding awareness and lack of a transnational cooperation culture in the sector:

- Lack of understanding and interest in the maritime sector among institutions and education organisations;
- Need to create more awareness – importance of collaboration particularly with and between institutions;
- Differences in the provision of education and training, notably in the development of competences and delivery of certificates which are often recognised only at the national level;
- Financial barriers which will not allow the continuation of cooperation unless new funding schemes are made available;
- Capacity to work in a network while actors are participating in a project;
- Difficulties in ensuring the continuation of project-based networks of collaboration in the long-term;
- Need to create financial instruments for the sustainability of networks, not only for their set up or creation;
- Challenges related to the fact that Maritime education systems respond to a national system of academic job titles and academic reconnaissance. For example, a person that studies in the UK will be granted with a British academic title that will not be recognised in France, whereas in France, North African titles are more recognised as they are more or less similar to the French system;
- There is a need to create a clear common recognition system that clearly links the different academic titles displayed by the different National Educative institutions. This fact limits exchange of students and then improvement of collaboration between organisations.

3 Synthesis of Field investigations

3.1 VET On Board – 'Marinate' the nautical training offer in Barcelona

3.1.1 Context

Barcelona was proposed as the first focus group location in the Western Mediterranean sub-sea basin. The Catalan Maritime Forum, that brings together various organisations from the private sector and which works intensively with regional universities, is actively pursuing actions in the area of education, clusters and international cooperation as cornerstone of any new developments taking place in this field. Maritime Economic Activities tackled at this focus group will be related to cruise shipping and coastal tourism. Also, two big players in Catalonia, the Generalitat (regional government) and the Polytechnic University of Barcelona, are both partner of various networks identified during the mapping exercise carried out under task 1 of the study.

3.1.2 Profile of Participants

The participants attending the focus groups covered the entire spectrum of institutions responsible for designing and providing the maritime education and training offer in Barcelona, and by extension in the region of Catalonia. In particular, the session counted with the participation of **representatives from the education institutions** (both higher and VET education) in the maritime field, **representatives from the business, industry and trade sector**, namely the Barcelona Cluster Nautic, the Chamber of Commerce of Barcelona and two representative companies and also the **regional and local government**. The event was enriched with the assistance of leading **international organisations** in the Mediterranean such as the Union for Mediterranean, the Inter-Mediterranean commission of the CPMR (Conference of Peripheral Maritime Regions) and the European Neighbourhood and Partnership Instrument (ENPI) project led by the Chamber of Commerce of Seville devoted to support and foster exchanges initiatives of student in the Mediterranean countries.

3.1.3 Needs and Challenges

The importance, added value and potential of growth of the nautical sector for the city of Barcelona. is well-known. However, if the city wants to maintain its leadership position in this field, guarantee the growth rates and make the most of this sector potential development, it **needs** to make sure that the right framework is in place. Among all the elements required for this sector to perform and increase its competitiveness, the training and VET programmes play a fundamental role in being the education level capable to provide the students, and futures professionals, with the qualified technical skills needed by the industry.

Bearing this in mind Port 2000 and the Barcelona Foundation for VET, the VET on Board Programme identified two important **challenges** in this field:

- Firstly, they recognised an important lack of knowledge coming from the private companies of the city, many of them being foreign companies, about the VET system and programmes offered in the city. The companies were not familiar with the functioning of the VET programmes and were not aware that many of the profiles required could be found in VET centres;

- Secondly, and when comparing the big numbers and growth potential of the nautical sector and the limited number of specific maritime-related educational and training centres, the main stakeholders operating in the sector pointed out a mismatch between the demand (both current and future) of skilled professionals and the offer of specialised training offer. The challenge was to make the companies understand that the profiles they were requiring do not need to have a purely maritime training background, but, on the contrary, the city counted with very well trained students in other relevant domains, who, with the right specialisation could be valid and very well prepared to work in the maritime industry. This idea can be denominated as a sort of "marinating", referring to this concept as making a training offer more maritime-focused. In this case, making a VET curricula and the students become closer to the sea and their specific particularities.

As a consequence of these two elements, the companies were not able to find in the city those well- trained professionals with the required right skills. As a result, job employment opportunities in this sector which shows high added value and high remuneration careers, were untapped.

This gap between the offer and demand of professional profiles is even more severe in the case of the luxury and top yachting industry. This industry and this typology of clients request excellent performance and high level job profiles that are not available at present in the region neither offered by the training centres. As a result, the local professionals do not have the skills to compete with foreigners in high profile jobs, required by the industry, meaning that the companies need to find and recruit this qualified staff in foreign countries.

Although a large potential growth of the sector is observed, this growth will be conditioned, among other elements, by the existence of an adequate work force that will bring excellence standards to the newly created services and products in the nautical and leisure sector. In other words, if the city wants to create the right conditions for the sector to growth and wants to make the most of it, it is crucial to address the mismatch between the offer and demand of professional profiles providing the right job profiles to meet the requirements of the very high demanding nautical industry.

This could only be done with an active involvement of all the community, the public sector, the private companies and the education community to jointly design, develop and implement new VET programmes (or adapting already existing ones) capable to meet the market needs and requirements.

3.1.4 Rationale for Cooperation

The rationale for cooperation can be described as bringing the training and the private sector closer in order to contribute to close the gap between offer and demand, providing students with the experience required by the market.

'Marinate' the VET offer

An important element of the whole initiative is that the programme does not intend to create *ad hoc* curricula but rather adapts existing VET curricula such as carpenters, electronics or hostelry to existing demand for sea-related jobs offers. This implies that professionals of the sea are integrated in the regular training programmes, thus bringing new knowledge domains specific to the sea. "To be a carpenter in a big ship is not the same as being a carpenter in a big house". This process is also regarded as more efficient than just "creating or setting up brand new nautical VET curricula",

which is something that will be more resource-intensive and which will not necessarily bring the same results.

Cooperation between the triple helix and the role of the private sector

All three parts of the helix (private sector, public authorities and VET education providers) have agreed around the idea that VET on Board could have only be achieved because of cooperation, working in different networks and the decisive role of the cluster, facilitating contacts and playing a brokerage role which is very highly valued. It cannot be forgotten that the cluster itself counts as active members with the actual companies that will ultimately hire these students which has been trained in accordance with the needs expressed by them.

With respect to the objective of **growing** the programme, the initiative could be expanded at local level by incorporating additional institutions, education centres and private companies to the programme. In this respect, the partners involved are already working in this direction and a number of meetings, events and informal exchanges are taking place in order to disseminate the programme. This contributes to awareness-raising among relevant stakeholders, and should lead to an increase in the number of students awarded with fellowships and therefore could contribute to increase the overall impact of the programme. Within this process, a need to step up further cooperation with the private sector will be also required.

Finally on the point of rationale for cooperation, and with respect to **capitalisation**, all the involved participants agree to emphasize that models that work should be shared, looking for good practices to improve and, as a consequence, an initiative as such could be capitalised and extrapolated to other key economic sectors as well as other territories.

3.1.5 How to make it work?

From all the above, and in order to address the identified needs and challenges described in the previous sections, the implementation of the rationale for cooperation took place as follows.

The public institutions, the private companies and the education community began to work together to design the so-called VET on Board Programme, an initiative to strengthen the link between vocational training and the companies from Barcelona's nautical sector with the final aim of contributing to develop a training system able to meet the needs of the nautical sector.

To this end, the Barcelona Foundation of VET (hereafter, the Foundation) was established in 2012 through a partnership agreement with the Marina Barcelona 92 (hereafter MB'92) to launch the VET on Board Programme and thus to promote the training and specialisation of VET students from Barcelona within the nautical sector.

This agreement was strengthened through the signature in 2014 of a cooperation agreement between the Foundation and the Barcelona Cluster Nautic from which the Programme was extended to all the companies and organisations associated to the Nautical Cluster. Thanks to this agreement the cluster's companies were able to host or request students enrolled in vocational training centres in Barcelona to take part in practical training placements. It also represented a qualitative leap for the programme in the sense that the number of companies involved in the initiative was increased providing a greater number of options to the students.

The agreement between those two organisations also envisaged the creation of a job search engine aimed at graduates of vocational training. Barcelona Activa, the agency responsible for

promoting the economic development of the city, is also involved in the initiative by providing technical English lessons to the participant students.

Table 3-1 Stakeholders involved in the VET on Board Programme

- **Fundació BCN Formació Professional**[28]: the Foundation jointly develops projects between the productive sector, schools and other institutions involved in VET city. Its main objective is to design and implement projects responding to the needs of the productive sector;
- **Port 2000**: it is urban management unit, with legal personality, constituted by the Port of Barcelona in 1988. Under his tutelage, its powers are exploiting the public spaces of Port Vell and New Bocana, as well as maintenance, cleaning and conservation and operation and management office building located on the street d'Escar corner with the Paseo Joan de Borbon. Through the management of public space port, Port 2000 serves citizenship and Barcelona, and promotes the interest and presence of citizens and tourists in the Port;
- **Marina 92**[29]**:** founded in 1992, MB92 is an expert management company in the maintenance refit and repair of super yachts. It counts with facilities of 76.000 m2. It is committed to continue on-the-job training for their employees in areas of naval engineering, risk prevention, languages and design programmes. It is very active in cooperating with other local actors at local and regional level in order to find solutions to match the gap between the offer and demand of maritime training and education programmes and professionals;
- **Barcelona Cluster Nautic**[30]**:** is established in October of 2013 with the goal of transforming water sports activity into an economic driving force for the city, its metropolitan area and for the country, taking full advantage of the existence of a sector which brings together industry, companies, entities and research centres, a mix that has enormous potential to generate wealth and added value. It currently has almost fifty members, including the Town Hall and the Port of Barcelona, Barcelona Regional, Marina Barcelona 92, Marina Port Vell, la Universitat Politècnica de Catalunya (UPC), Consorci El Far and Fundació Navegació Oceànica Barcelona (FNOB), all active partners. Barcelona Clúster Náutic is born out of the conviction that the nautical sector can become a major player in the economic growth of the country and in creating wealth and jobs. The mixed structure of this Cluster, made up of private and public agencies, allows the public administration to have different public policies participate in the entity, favouring its cross-disciplinary profile in benefit to the city as a whole, as well as to the possible integration of regional policies. Furthermore, the existence of an important corporate fabric within the Cluster provides operational facilities, broader and deeper knowledge of the sector and its job market, as well as more possibilities for interaction and transfer of know-how between different players. Barcelona Clúster Nàutic wants to take on a unifying role that articulates dialogue between authority, industry and community;
- **Barcelona Activa**[31]**:** Barcelona Activa is integrated in the Area of Employment, Enterprise and Tourism at Barcelona City Council; it is responsible for promoting the economic development of the city, designing and implementing employment policies for citizens, and encouraging the development of a diversified local economy. For the last 28 years it has been a driving force behind Barcelona and its hinterland's economic activity, supporting policies to develop employment, entrepreneurship and business, while promoting the city and its strategic sectors internationally, but from a regional perspective

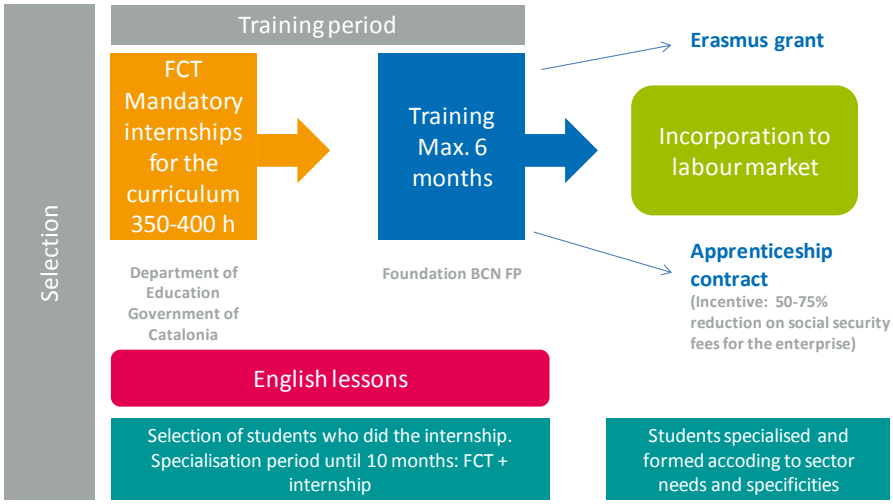
As presented in the figure below, through this programme, vocational training students can carry out the compulsory curricular internships (the so-called FCT – *Formación en centro de trabajo*, workplace training) at one of the around 60 companies and organisations associated to Barcelona Clúster Nàutic and MB'92. Once completed this compulsory internship period, selected students

[28] http://www.fundaciobcnfp.cat/index.php/ca/
[29] http://www.mb92.com/
[30] http://www.barcelonaclusternautic.cat/ca/home
[31] http://www.barcelonactiva.cat/barcelonactiva/cat/

can enjoy a student grant awarded by the Foundation and financially supported by the company (*Beca – Empresa*, Fellowship - Company). Likewise, it is possible to extend this period by an educational specialist Erasmus+ scholarship in companies based in other European cities.

At the end of this process, students should count with those very concrete competencies and experience required by the sector which should contribute to open the doors for them to enter in the labour market in this very specific and high-demanding sector.

Figure 3-1 **VET on board programme scheme**



Below, the phases of the programme are described:

1) **Selection:** the initiative counts with a preliminary phase devoted to select the participants who will be part of the programme. In order to do so, the Foundation acts as a facilitator between the company and the schools to know the recruitment needs of the company and to identify and select, together with the schools, the right student's profiles;
2) **Workplace training (*FCT – Formación en centro de trabajo*):** a compulsory training module that each student has to undertake as part of his/her regular VET programme. Its aim is to complement through a practical experience in a company the theoretical modules given at the school so to allow the student to acquire the required work proficiency. This period, which lasts between 350-400 hours (depending on the VET studies) is regulated though a collaboration agreement undersigned by the company, which need an ex ante authorisation to from the competent regional authority to host trainees, the school and the student. Each student has two mentors both in the company and in the school which are responsible to track and assess whether the student has acquired the expertise required for the future professional performance. The company does not have to incur any cost;
3) **Fellowship – company (*Beca – Empresa*):** A selected group of students who have satisfactorily completed the workplace training, would be awarded with a grant from the Foundation to undertake an additional internship with a duration of a maximum of 6 months with a maximum of 5 hours per day. The aim of this 6 months fellowship, that has to be carried out at the same company as the previous training, is to strengthen and deepen the practical learning acquired during the first phase of the Programme (compulsory workplace training). The cost for the company will be between € 367 and € 450 per month depending on the number of effective hours worked by the fellow. However, it will be the Foundation the responsible for managing the fellowships, preparing all the administrative documents, monitoring the training plan and the performance of the student. The Foundation will also carry out a final evaluation of the whole process once the programme is finalised;
4) **English lessons:** one of the lessons learnt from the first edition of the Programme was the need to improve the English knowledge of the students. With this aim, the Foundation signed

an agreement with Barcelona Activa to provide and fund English lessons to the students. During the two phases of the programme each participant will be provided with 2 hours per week English lessons tailored to the linguistic needs of the sector;

5) **Erasmus :** Within this process, the Foundation encourages the students to take part in the Erasmus+ initiative. It tries to support the mobility of students and graduates in VET, in order to acquire, through a stay in another EU country, new knowledge, skills and qualifications that will be useful in their personal and professional development. The Foundation, along with SEPIE, -the Erasmus+ National Agency- establishes agreements for students or VET graduates over 18. The stay would have a duration of 2 months and be awarded with a grant of € 600-800 per month.

Since the programme was launched a total of 55 students and around 10 companies and schools have participated in the initiative.

Table 3-2 Type and number of participants having attended the VET on board programme

	2013-2014	2014-2015	2015-2016
Participating students	30	25	Currently undertaking the selection phase
Companies	10	11	Currently undertaking the selection phase
Schools	11	12	Currently undertaking the selection phase

The three editions of the programme have proved the added value of the initiative as well as the important benefits for all the participating actors. Companies have reported that it is a very valid tool for them to attract talent, to share the costs of training of their new staff, to reduce the costs of recruitment and, in general terms, to contribute to create a source of qualified young professionals.

As for the students, this is regarded as an excellent initiative to acquire practical skills directly from the industry and adapt their professional profiles to the requirements and needs of the private companies and thus to make easier their transition to the labour market.

Although the programme has still a long way to go to improve its performance, mainly with the aim of increasing the total number of students who at the end of the process are hired by the companies, VET on Board can be considered as a success story. It could serve as an example for other similar settings as well.

3.1.6 Conclusions and lessons learnt

An initiative of this nature, which materialises the cooperation of different stakeholders aiming to bring the training and the private sector closer, can clearly contribute to close the gap between offer and demand and provides students with the experience required by the market.

An important success element is that the programme does not intend to create *ad hoc* curricula but, from an existing demand of sea-related jobs offers, existing VET curricula such as carpenters, electronics or hostelry were adapted to the sea, meaning by this that professionals of the sea are integrated in the regular training programmes. This process is also regarded as more efficient than just “creating or setting up brand new nautical VET curricula”, which is something that will be more resource-intensive and which will not necessarily bring the same results.

Cooperation between the triple helix is crucial as well. All three parts of the helix: private sector, public authorities and VET education providers agree around the idea that VET on Board could have only be achieved because of cooperation, working in different networks and the decisive role of the cluster, facilitating contacts and playing a brokerage role which is very highly valued. It cannot be forgotten that the cluster itself counts as active members with the actual companies that will ultimately hire these students which has been trained in accordance with the needs expressed by them.

In short, although the programme has still a long way to go to improve its performance, mainly with the aim of increasing the total number of students who at the end of the process are hired by the companies, VET on Board can be considered as a success story. It could serve as an example for other similar settings as well.

The initiative could be expanded at local level by incorporating additional institutions, education centres and private companies to the programme. In this respect, the partners involved are already working in this direction Within this process, a need to step up further cooperation with the private sector will be also required.

With respect to capitalisation, all the involved participants agree to emphasize that models that work should be shared, looking for good practices to improve and, as a consequence, an initiative as such could be capitalised and extrapolated to other key economic sectors as well as other territories.

3.2 A recent initiative from Malta: Malta Marittima

3.2.1 Context

Malta has a centuries old maritime tradition. The strategic location of the Maltese Islands at heart of the Mediterranean Sea, its natural harbours, and the entrepreneurial and maritime skills of its people have, since time immemorial, conspired with its history and millennial culture and made it an international maritime service centre. This also clearly came forward in the strong interest for the focus group and the great willingness to participate.

La Valletta – Malta was the second location for a focus group for a number of reasons. Its central location in the region makes it suitable to act as a potential connector to existing networks in training and education. Moreover, the University of Malta is a member of different kinds of networks: networks of education providers (the EuroMed Permanent University Forum) as well as project-based networks (Perseus, Seatalk). The Malta College of Arts, Science and Technology (MCAST) is another key actor and provides VET courses, also for the maritime industry. Recently, Malta's political administrators have publicly recognised a skills mismatch issue, as presented in the National Reform Programme 2015. Addressing such issues is part of a wider governmental plan to raise the profile of the island's maritime industry.

3.2.2 Profile of Participants

The participants were a mixture of government representatives, education and public/ private partnerships:

- **Government**: Two representatives from Transport Malta, two from the Ministry for Transport and Infra. Advisor to the parliamentary Secretary;
- **Industry and trade**: Ship building, marine supplies, ship repair, commercial and passenger transport, oil tanking;

- **Education**: the Ministry of Education, the University of Malta and Malta College of Arts Science and Technology (MCAST);
- Chamber of Commerce, Valletta Gateway Terminal, Malta Maritime Forum, Chartered Institute of Logistics & Transport.

MCAST acted as the host of the focus group. The VET college provides full-time and part-time evening courses across a range of disciplines – including the maritime field. Full-time students can study for free: they get an allowance from the government. Evening courses are for those already employed, and are mainly funded by companies. These are short courses, with commercial fees. MCAST has courses at EQF level 3 to 6, and will offer 7 in the near future. In total there are 6 000 full-time students and 4 000 part time. MCAST designs, develops and reviews course offering, and also acts as certifier. MCAST was very eager to host the focus group, and the VET college was more than helpful in both the preparation and implementation of the focus group.

3.2.3 Needs and Challenges

More is needed to keep Malta's maritime sector in the lead

Overall the impression amongst stakeholders in Malta is that more needs to be done to keep the island's maritime sector in the lead. It is considered essential to invest more in the young generation. Despite its importance and recognition, the training offered by MCAST is – according to some participants - for the maritime sector "just scratching the surface". Nevertheless there is regular contact with the industry, ministries and international exchange of students and knowledge and MCAST fully taps in on all the means they have. MCAST notes that there is a huge pressure from industry to offer more and different courses. There is a need to restructure the courses and to address the needs of the industry. Finding the resources needed is a big issue. Investors are needed. MCAST sees it as its duty to bridge the needs between employers and education.

Within MCAST, the MTC is the Maritime Training Centre - offering a full range of course, except in tourism. Almost all lecturers are part timers. It is extremely difficult to find a full-time lecturer in this industry. That is one of the major challenges for MCAST. The programmes are 3-year: 1 year at school, 1 year at sea and then a third year back at school.

Very hard to get qualified and certified people from Malta

It is difficult to get certified people in the maritime sector in sufficient numbers from the island. Students are rather sent abroad, to the UK primarily. The current students, neither those from MCAST nor from the University of Malta, do not benefit from programmes that are certified. That implies that graduates cannot be exempted up to level 5, and thus students are being 'lost'. Even on the deck side, the training does not meet the demands. The IMO does not match normal courses. There should be a mapping with these standards, so that the courses lead to proper qualifications. There are only very few people on this island that are able and willing to do this mapping.

Because there are not enough qualified people, succession planning in business is becoming more and more difficult. Often foreigners are needed to take over.

Transport Malta: "we have a big skills gap!"

Transport Malta confirmed that there is a major skills gap, and that there is a need to send a very clear message. The inspectorates of Transport Malta (including Ports Authority, Maritime) do not have enough people with the skills needed.

The skills gaps are not typical of our times: there have been shortages in the past as well. There is a need to invest in education at all levels, not just university. Also at the lowest level, there is a need for people. Niche courses are in demand, not just degrees. And there is a need to avoid fragmentation.

Lack of sea-going experience

One of the key issues is that students lack sea-going experience. There is a need to increase the workforce in these areas. There is no other option than to source them from overseas. For example, three ex-students from MCAST didn't apply for a job that was considered appropriate for them. The generations have changed: young people seem to prefer office work. It is also a matter of work ethics, not only maritime skills.

The maritime industry is not perceived as an attractive industry to work for

The profession is not able to show how proud it is of this industry and to enthuse the young generation. Malta is an exceptional place, with a long history in the maritime sector. However that does not translate to the maritime sector being seen as an attractive career opportunity.

3.2.4 Rationale for Cooperation

High costs of maritime training

The cost per student in maritime training is high. More support is needed from the government and Transport Malta. Indeed, the financial aspects of maritime training are certainly important. Attendees stressed the need to look at things from an international angle. "We need help, and help is available in international networks and relationships. We should not reinvent the wheel. There are a lot of courses available in other countries: let's cooperate." Even when using existing courses from elsewhere, there is still a cost associated with that.

Increase interest in the maritime profession

In light of the skills gap, and the difficulties to fill maritime vacancies including those in ports, participants stated the need to go into secondary schools to explain to students and their parents that the maritime sector offers career opportunities.

Attract international students – and prevent brain drain

A lot of students want to study engineering, also at university level. It attracts a lot of foreign students as well. Big advantage here is the international accreditation which makes it easier for students to study elsewhere. The University of Malta has appointed one representative that is also present in the Malta Maritime Forum. Internally she is responsible for the Knowledge Transfer Office, which calibrates the course with industry.

Participants stated that most maritime-related courses are found in the engineering sector. There is a bachelor's degree in maritime engineering to base on: it starts with a very technical curriculum. There is also an urgent need for courses on port authorities (Malta being the number 1 country for ship registration). Furthermore, there is a need to relate to Eastern Mediterranean and African countries.

Lack of information and coordination

The maritime industry is very diverse while it overarches various fields from the rather traditional, transport and logistic sector to energy, natural environment, security and tourism. Expanding this scope (example: opportunities offered by super yachts) needs to be taken into account when addressing educational needs.

A national information base about the industry is missing. Therefore an overview is missing of vacancies and jobs for the sector.

A platform is needed to coordinate the work of different actors in the maritime sector – the Malta Maritime Forum.

There is a need to improve connections and linkages between different ministries (e.g. Ministry of Transport, Ministry of Tourism, Ministry of Education) involved with the maritime and the national agenda – the Malta Marittima Agency.

3.2.5 How to make it work?

Both the Malta Maritime Forum and Malta Marittima have been established within the scope of one year to organise a way that different industries and academia within the maritime sector have shorter ways to find each other. The text below will focus on Malta Marittima, however the full case study in Annex also reports on the Malta Maritime Forum.

Malta Marittima[32], an Agency under the Government of Malta, was established at the beginning of 2016[33]. Building on the outcomes of the Malta Integrated Maritime Policy[34], one of the Agency's main objectives is to bring industry and government stakeholders together so as to focus and promote the continued and enhanced development of the marine and maritime industries in the Maltese Islands.

The vision of Malta Marittima is to place Malta on the global map for entrepreneurship, through expanding maritime opportunities, including active participation through EU policy and research. The Agency aims to bring collaboration between government, industry and academia in the maritime area.

To reach this vision, Malta Marittima has set for itself a number of operational objectives that direct the sector towards a more sustainable, innovative and competitive area with added value of future jobs:

- Create and promote maritime sectoral clusters;
- Maintain open dialogue between private and public stakeholders;
- Strengthen the competitiveness and support of the clusters;
- Lead the sectors towards innovation based economies;
- Promote environmentally sustainable projects;
- Propose to Government maritime policy and infrastructural improvements;
- Lead towards the creation of increased added value and future proof jobs;

[32] For more information see: http://www.maltamarittima.org.mt/
[33] See the government Legal Notice 41 of 2016 at http://justiceservices.gov.mt/DownloadDocument.aspx?app=lp&itemid=27297&l=1
[34] Government of Malta (2013) Integrated Maritime Policy: The waves that shape us make us stronger. Retrieved from: https://economy.gov.mt/en/public_consultation/documents/integrated%20maritime%20policy.pdf

- Encourage transfer of knowledge between academy and business;
- Promote maritime cultural awareness and education opportunities locally;
- Maintain inventory, statistics and progress of sectoral clusters; and
- Promote and participate at EU fora and internationally.

The steering committee[35], together with the industry representatives, form a governing board - the Malta Marittima Board. Next to that, Malta Marittima is supported by a specialised team of executives who will coordinate the related policies which concern education and research, environment, spatial planning, and safety and surveillance. The executive team is tasked with the above objectives, notably the establishment and provision of support to the clusters which themselves address the diverse array of activities in the marine and maritime domains.

From the desk research and interviews, it has become apparent that the expected contribution of Malta Marittima lies in three pronounced axes: 1) serving as a one-stop-shop in the overarching maritime domain; 2) approaching the academic offer on the island as one reflecting the holistic nature of the sector and 3) the development of clusters.

Axis 1) One-stop shop

The maritime sector encompasses an immense variety of activities and actors that are directly and indirectly linked to the sea. For illustration to name a few: the Ministry of Transport is involved in maritime transport; the Ministry for Sustainable Development, the Environment and Climate change has environmental protection of the coast under its portfolio while the Ministry for Energy and Health covers ocean energy. And although one may have good intention in mind to seek and establish cooperation, when it comes to making decisions and commitments, each representative easily defends its own thematic area. Fragmentation has been a great obstacle in understanding what the maritime sector needs and how to deliver those needed services, skills and expertise.

The driving force for establishing Malta Marittima was to enable efficient mediation among all actors involved and stimulate entrepreneurship. It is now able to offer a one-stop-shop service with executives as well as board members from all corners of the sector, having a wide network of contacts in the maritime field. How the Malta Marittima will exactly achieve this will become more clear in the coming months. At this stage in time, the government representatives speaking about Malta Marittima are well aware of its potential and ability as a smaller size organisation with extensive network to serve as a mediator and driver of innovation in the sector.

Axis 2) Academic offer reflecting the holistic nature of the maritime sector

The current offer of the University of Malta and Malta College of Arts Science and Technology (MCAST) is based on traditional views on the maritime sector. The courses offer training on transport and logistics, engineering and maritime law, geo-sciences and oceanography. The maritime world is however broader than this, encompassing areas such as spatial planning, security, natural environment, ocean energy and tourism. Next to that, giving a more business and economic flavour to the courses is needed in order to enable Blue Growth to materialise on Malta, according to the experts consulted.

[35] The steering committee is composed of ten members, five of which are nominated from within the public sector, viz., Transport Malta, Department of Fisheries and Aquaculture, Malta Freeport Corporation, Regulator for Energy and Water Systems, Malta Enterprise; and five others which are appointed by government through a consultation process with industry stakeholders.

Malta Marittima is well aware of the need that academia has to expand in its offer to train students into professionals in more disciplines of the maritime - and has actively initiated its work on achieving this. Discussing with the MCAST the possibility to include modules in bachelor's and master's studies that widen the expertise and skills of the prospective graduates is one of the first steps.

Axis 3) Development of clusters

There is a wide range of companies and organisations already active in the maritime industry on Malta, and services vary broadly. The grouping of these activities holds potential for establishing a number of closely-knit maritime clusters that will bring the business and non-business members together. Each sectorial cluster will be comprised of businesses, industry associations, government departments, academic and research institutions.

3.2.6 Conclusions and lessons learnt

Both the Malta Maritime Forum and Malta Marittima have been established within the scope of one year to organise a way for different industries and academia within the maritime sector to find each other more easily. Although only recently in place, both the MMF and Malta Marittima have the aspiration of implementing a holistic approach to finding solutions to the challenges that industries and the academia in the maritime face. Through the development of the Malta Integrated Maritime Policy and its implementation agency – Malta Marittima – the islands has also experienced the need for a philosophical change in the approach towards the maritime world within academia - it is more than about transport, logistics or engineering.

Finding ways to make the cooperation between the industry, education institutions and business possible and more pronounced within the maritime domain does not only involve knowing the right people but also being able to change mind-sets of actors involved. The experience of Malta Marittima shows that although Ministries want to cooperate and support the industry, the bureaucracy inherent to administrative organisations is a common barrier towards cooperation. This in turn slows the process in supporting the education institutes in developing programmes that support the immediate needs of the industry.

From the experience of Malta Marittima, lessons can be drawn and shared with other Mediterranean countries when wanting to adopt similar initiatives. The overarching aim of the Agency prior to its establishment was to provide an efficient way for stakeholders in the maritime network to find each other in looking for ways to solve the challenges at hand. With this narrative, Malta Marittima has gained the momentum to have all involved ministries and industries with the sector behind it.

3.3 Blue Career Centre for the Eastern Mediterranean

3.3.1 Context

Larnaca, Cyprus, was the location for the third focus group, as there is already formal cooperation between international partners. Cyprus is home to the Maritime Institute of the Eastern Mediterranean (Mar.In.E.M.)[36], a non-profit organisation offering a mix of services benefitting the

[36] see www.marinem.org

maritime economy of the region. Services include: research, education and training within and for the Maritime Industry, forum and incubator of business opportunities; facilitating cooperation among the sector's stakeholders in the region. At the end of 2014, Mar.In.E.M. signed a Memorandum of Understanding with the Arab Academy for Science, Technology and Maritime Transport. Focusing on shipping, the collaboration provides opportunities for developing joint activities in relation to maritime R&D, maritime education and training as well as green shipping and quality shipping. Cyprus has already demonstrated to have a strategic position in the East Mediterranean region, where room for cooperation is limited due to the instability and political context.

The focus group targeted the subject of **Integrated maritime education and training opportunities in the area of Maritime Technologies.** Such technologies are crucial for the development of a wide range of Blue Economy activities, notably shipping, ports development and the energy sector. Currently, the educational and training offer catering towards these professionals and practitioners is still fragmented and much scope for international cooperation exists in this domain. A long list of potential participants was then drawn up, starting with the above-mentioned Arab Academy of Science, Technology and Maritime Transport as a key player. The Larnaca focus group managed to assemble, perhaps for the first time, participants from Cyprus, Egypt, Greece, Jordan, Lebanon and Turkey to discuss and cooperate on this subject.

3.3.2 Profile of Participants

The participants were primarily from the maritime education field, focusing on naval engineering, as well as some business and government representatives.

- **Education**: Two representatives from the University of Cyprus, one representative from the Cyprus Maritime Academy, one representative from the Arab Academy for Science, Technology and Maritime Transport (based in Egypt), one representative from the National Technical University of Athens (Greece), one representative from the Hellenic Postgraduate Merchant Marine Academy (University of Piraeus, Greece), one representative from the Jordan Academy For Maritime Studies, one representative from the AL-Manar University of Tripoli (Lebanon) and one representative from the Istanbul Technical University from Turkey;
- **Business, Industry and Trade**: One representative from the Mar.In.E.M., one representative from the Cyprus Naval Architects & Marine Engineers Association and one representative from the Cyprus Shipping Chamber;
- **Government**: One representative from the Cypriot Ministry of Education and Culture, one from the Department of Merchant Shipping (Ministry of Transport, Communications and Works of Cyprus).

3.3.3 Needs and Challenges

The Larnaca Focus Group participants underlined the strong need to promote a better balance between demand and supply of maritime professionals in the region. The background lies in the fact that large numbers of maritime professionals are being educated on the Southern or Eastern shore of the Mediterranean, whilst appropriate employment opportunities are offered on the Northern shore (e.g. Greece, Cyprus, Turkey). In order to book progress, two distinct actions/challenges can be thought of:

- Better map and understand the demand and supply of maritime professionals in the region. In this respect, a monitoring study is currently being launched by the Cyprus Shipping Chamber (February 2016);
- Take actions that take away the necessary barriers; such barriers can be manifold including language, cultural and/or religious barriers, perceptions, etc.

Building on the discussions within the focus group, a range of needs have been recorded. These include:

- Catalogue the offer of maritime education and training in the region, including availability of infrastructure;
- Promote the sharing and pooling of resources, such as maritime simulators and a training vessel. This Action is considered much needed and the Eastern Mediterranean basin appears to be the right scale for starting this action, due to the short distances between the institutes involved and the cultural proximity. However, it is important to make clear arrangements between the partners involved (particularly related to costings and access), and detail these to a great extent – in order to prevent any future misunderstandings;
- Blue Career Fair of the Eastern Mediterranean. This initiative can be considered highly favourable, as the interest amongst participating actors is very high. Furthermore, the action can already build on the existing Blue Career Days, organised by the Maritime Institute for the Eastern Mediterranean for several years already. It is an excellent opportunity to provide visibility to the Blue Career Centre and engage with the broader community of maritime professionals and students.
- Promote the mobility of students and staff within the region;
- Make efforts to balance the demand and supply of maritime professionals in the region;
- Work towards the harmonisation of requirements for maritime professional training, focusing on practice (mostly sea-faring). Skills and qualification recognition in the maritime professions pose a major challenge. Whilst higher education degrees within the EU are recognised through the Bologna process, this is not yet the case for non-EU programmes neither for vocational education and training programmes. Actions towards harmonisation in vocational training take place in the context of EQAVET – European Quality Assurance in Vocational Education and Training. This action is therefore considered to be not necessarily of an East Mediterranean scale. Rather, active support to the Greek and Cyprus members to prioritise maritime professions is an alternative. Furthermore, such harmonisation efforts require a very long time span – hence the recommendation to not prioritise this action right from the start;
- Act as a body towards the application of projects (e.g. EU funded projects).

Criteria proposed to prioritise these actions are as follows:

- Needs for young jobseekers in the maritime economy of the Eastern Mediterranean, and to support businesses in finding the right staff with proper qualifications;
- Added value for taking forward at the Eastern Mediterranean scale;
- Feasibility – taking into account existing experiences to build on and the time horizon needed to book results.

3.3.4 Rationale for Cooperation

The sea as a unifying element and important stabiliser

In the context of the East Med, the group immediately recognised the benefits arising from international cooperation. At a strategic level, participants agreed that the creation of economic growth and jobs from the seas can help to stabilise the situation in the region. Therefore, businesses need to be able to grow and young jobseekers need to have prospects. The sea as a unifying element in this fragile reason was recognised by all. A need for concrete initiatives was felt by all as well – and now is the time to act. In addition, participants agreed to collectively work towards highest possible safety standards and records for sea-farers.

Eastern Mediterranean as the right geographic level to collaborate

In discussions about the geographic scale, participants recognised the fact that maritime affairs are of a global nature and that both education and training providers and businesses need to have such a perspective. Participants from Cyprus acknowledged that their focus had been strongly on Europe in the last decades. All participants felt that a pan-Mediterranean initiative would be too far-fetched due to the large cultural and linguistic differences as well as the large distances within the sea basin. Therefore, participants concluded firmly that any initiative would need to be at the level of the Eastern Mediterranean – and base itself on the long cultural and economic traditions in the region – going back even thousands of years. The commonalities within the region are too easily forgotten by the recent upheavals, tensions and crises.

A recognition of Cyprus as a hub for cooperation

All participants agreed that Cyprus can play a pivotal role in the launch of an Eastern Mediterranean initiative, as it is geographically central – with extremely short distances to all countries concerned. Perhaps more importantly, Cyprus has demonstrated to be very capable in building up and maintaining fruitful collaborative relations with partners both within the EU and outside the EU.

Sharing and pooling of resources, such as training simulators and a training vessel

The costs of maritime education and training are relatively high, and this is due in part to the need to provide real-life experiences and skills development through maritime simulators, and spending time on board of ships. Maritime simulators are essential for a range of nautical professions, not only for shipping but also for other activities including offshore oil and port-related activities (tugging). Maritime simulators require high upfront investment costs, and represent a major investment for many of the maritime education and training institutes. The availability of such infrastructure amongst participating institutes needs to be properly mapped (see Action 1 below). It is already clear that certain institutes are short of such up-to-date infrastructure, whilst others are well-equipped. This builds the case for exchanges on experiences in using such infrastructure, market trends, joint purchases and/or pooling and sharing of existing resources.

Exchanges during and surrounding the Larnaca focus group also demonstrated that there is indeed a strong interest in sharing similar experiences with existing maritime training simulators in the region, including the sharing of market trends and experiences. For example, new generation maritime simulators are entering the market and offering high performance at reduced costs (e.g. V-STEP certified simulator series). Shared purchasing of maritime simulators would offer many benefits, such as 1) Stronger position vis-à-vis sellers; 2) Possibilities for building and maintaining joint instruction programmes, allowing for the easy exchange of; 3) Sharing of experiences in the performance of such simulators over time; 4) Harmonisation of training programmes; and 5) Increased exchange of students and staff.

Initiative to establish a Blue Career Centre for the Eastern Mediterranean

The Larnaca focus group participants unanimously agreed to take a next step, namely to take the initiative to jointly establish an Integrated Maritime Regional Career Centre for the East Mediterranean or a “Blue Career Centre for the Eastern Mediterranean” to be established in Cyprus – possibly with antenna’s in neighbouring countries. The Centre would have the aims described above as needs.

The global aim of the Blue Career Centre is to contribute to the creation of sustainable economic growth and jobs from the seas and thus to the stabilisation and prosperity of the Eastern Mediterranean region. After all, the East Mediterranean Sea has been a unifying element in this region for thousands of years already. More specifically, the Blue Career Centre *seeks to provide*

prospects for young jobseekers in the maritime economy in the Eastern Mediterranean, and to support businesses in finding the right staff with proper qualifications. The Blue Career Centre will be established in Cyprus and will include active participation and engagement of all countries, institutes and/or individuals involved from Greece, Turkey, Egypt, Lebanon and Jordan notably. In order to make it work, the following short-term actions are foreseen:

3.3.5 How to make it work

Catalogue the maritime education and training offer in the region

As a first step in cooperation, it is essential to build a full overview of the existing training offer in the region, including degrees offered, length of courses, overviews of modules, languages used and pricing. Reference to be made to any existing joint programmes and initiatives offered right now, as well as information on skills qualification and recognition issues and procedures to overcome these. It would be very useful to include an overview of existing infrastructure, e.g. marine simulators, training vessels and other infrastructure – providing input to any pooling and sharing initiatives (see Action 2 below). Experience from similar initiatives (e.g. Erasmus Mundus programmes) points to the need to invest time and efforts into a joint understanding of the maritime education and training offer in the region. This action can be considered feasible and be carried out in the short-term (2016).

Promote the sharing and pooling of resources, such as training simulators and a training vessel

The modern infrastructure of the Arab Academy for Sciences, Technology and Maritime Transport in Egypt deserves to be highlighted, as it can be considered elaborate and advanced, if not world-class. It includes a variety of Marine Simulators, Vessel Traffic Service Simulator (VTS), ECDIS Lab Simulator, Mini Bridge Simulator, Full Mission Engine Room Simulator, Offshore Simulators, Full Mission Offshore Vessel Simulator "Class A", Full Mission Offshore Crane Simulator "Class A", Dynamic Positioning Labs, Liquid Cargo & Natural Gas Simulators, Liquid Cargo Handling Simulator, Natural Gas & Petrochemicals Simulators), Engineering Workshop, Global Maritime Distress & Safety System Simulators, Maritime & Offshore Safety Facilities, Helicopter Model on Helideck, Advanced Medical lab, E-learning Classroom, H2S control programs classroom (OPITO Approved), Fire Fighting Facilities (Fire Fighting Lab, Fire Ground), etc.

The sharing and pooling of resources can be considered a promising activity, as access to such infrastructure is not equally spread in the region and as there is a strong willingness of the well-equipped institutes to collaborate with others in the region. Sharing of infrastructure provides important advantages, such as lower costs as well as increased transparency and harmonisation of training offer amongst participating institutes. Several initiatives already exist in this domain and within the EU, such as “Train the Trainer course material for Inland Navigation Education and Training[37]”.

A particular opportunity in the Eastern Mediterranean is offered by the availability of a Training Vessel, owned by the Arab Academy of Sciences, Technology and Maritime Transport. The modern purpose-built training ship – with a length of over 90 metres- is fully equipped and provides rich learning experiences to a wide range of maritime students and professions. The vessel is currently already used as part of the curriculum of the Jordan Academy of Maritime Studies.

[37] http://www.adam-europe.eu/adam/project/view.htm?prj=10733#.VsSF2P72aUl

Promote mobility of students and staff within the region

Mobility of students and staff has many advantages. It provides a rich experience for those involved, both at technical as well as at cultural level. It also increases the employability of the students and staff, as the experience gained can be put on their CV and help to obtain good jobs. A recent initiative in this respect is the establishment of the Maritime Academy in Cyprus, by the University of Nicosia, the Arab Academy of Science, Technology and Maritime Transport, the Maritime Institute of the Eastern Mediterranean and Intercollege. The Academy will offer shipping-related courses taught in English to Cypriot and foreign students. The courses include Shipping & Logistics Management, Maritime Transport, Marine Engineering and Marine Electrical Technology.

Many initiatives already exist at the European level, notably the Erasmus + programme. Erasmus + has now many components and includes not only the famous Erasmus Students Exchange programme (already more than 1 million students having benefitted from this exchange), but also the now mainstreamed Erasmus Mundus programme (offering opportunities to non-EU citizens) and the Marie-Slodowska Curie programme (offering opportunities for researchers and staff). At the same time, it is worth exploring how students and staff in the region can take advantage of already existing (EU schemes) and promote these amongst students and staff in the region[38].

Blue Career Fair of the Eastern Mediterranean

The “Blue Career Centre for the Eastern Mediterranean”, although based in Cyprus, would have branches or representations in the various countries of the region. A concrete joint initiative discussed – continued and detailed after the focus group meeting - was the organisation (from 2017 onwards) of an annual regional Job Fair for the Blue Economy to be called “The Blue Career Fair of the Eastern Mediterranean”. This Blue Career Fair will bring together and allow the interaction of students/graduates and their potential employers in a 3-day “festival” which will include competitions among teams from the various MET institutions, booths for the Academies & Institutions as well as the respective sector Companies-potential Employers /Recruiters. Participants taking part in this discussion agreed that such a Blue Career Fair would also include presentations by potential employers, conferences on relevant subjects, interviews of the job-seekers by potential employers, but also –outlets with ethnic food & entertainment as an incentive for the public to also pass from there with their children thus raising the visibility of and awareness on the blue professions.

Work towards the harmonisation of requirements for maritime professional training (mostly sea-faring)

This issue was much discussed during the focus group, and benefited from the presence of the Ministry of Education of Cyprus. The competent national body for the recognition of higher education qualifications is the Cyprus Council for the Recognition of Degrees (Kypriako Symvoulio Anagnorisis Titlon Spoudon, KYSATS). KYSATS recognises equivalence, or equivalence-correspondence for first cycle titles, or just equivalence for postgraduate titles (second or third cycle). KYSATS may also recognize joint degrees.

The establishment of a Quality Assurance Agency has been approved by the Council of Ministers of the Republic of Cyprus. The aim of this Agency is to promote quality assurance in both the public and the private institutions of higher education, through various measures which include external accreditation and development of internal quality culture. These efforts are in line with the Berlin Communique, the ENQA Standards and Guidelines on QA, as accepted by the Bergen Communique and the Agreement on Quality Assurance in the EU.

[38] Erasmus + is a European programme which is implemented by one or more National Agencies in Member States. See http://www.erasmusplus.cy and http://www.inedivim.gr/ or https://www.iky.gr

Promote the balance between demand and supply of maritime professionals in the region

Mapping and monitoring the demand and supply of maritime professionals in the region is an essential activity. However more thought and efforts are needed to still develop this action. Possibility would be to build a matching database for maritime professionals in the region, and/or build a specific maritime module to an already existing matching database in the region (see also the suggestion under Action 4 – the Online Job Fair). Any actions to take away barriers between demand and supply require close cooperation between maritime educational institutes involved and employers (both through Chambers of Commerce as well directly through ship owners). Progress can most likely be booked by setting up a specific Task Force or Roundtable including leaders from both demand and supply side.

Act as a body towards the application of projects (e.g. EU funded projects)

Many EU and international funding opportunities exist, notably in the area of education (Erasmus +), but also in the promotion of researcher mobility (Marie-Slodowska Curie, now part of Erasmus+) and research cooperation (notably Horizon 2020). The Blue Career Centre can act as an antenna to exchange information on such opportunities and to bring interested partners together – in close cooperation with the Erasmus + National Agencies[39].

Although cooperation in application of projects is always welcomed, this action may not necessarily be a top priority as it could possibly side-track the focus of the centre. Furthermore, the variety between institutes involved (higher as well as vocational institutes) causes differences in interest in such projects. In addition, several existing initiatives (universities such as the National Technical University of Athens, as well as maritime institutes including the Maritime Institute for the Eastern Mediterranean) already offer such services or intend to do so. Finally, many of such programmes require a larger geographic scope of cooperation, hence the Eastern Mediterranean may not be the most appropriate scale.

3.3.6 Conclusions and lessons learnt

When reviewing the above 7 actions, the first 4 actions are considered most promising in the short-term (catalogue of maritime education and training offer, pooling of resources, and related to that promote the mobility of students, and organise Blue Career Fairs). The remaining actions 5 (skills recognition) and 6 (balancing demand and supply in the region) are considered important and they need to be undertaken in order to build long-lasting progress towards the objectives of the Blue Career Centre, however they are not likely to produce results in the short term. Nevertheless, this prioritisation is only to be seen as the start of an exchange and debate with the initiators and partners of the initiative – who will need to develop further ownership of these actions still. When discussing these actions and when taking them forward, the following considerations can still be made:

- A Blue Career Centre for the Eastern Mediterranean will be more successful in case of existing trust and cooperation among the institutes and persons involved. In this respect, excellent bilateral links already exist (e.g. between Cyprus and the Arab Academy, between Cyprus and Greece, between the Arab Academy and Jordan as well as Lebanon) – and it is important to build on these;

[39] Erasmus + is a European programme which is implemented by one or more National Agencies in Member States. See http://www.erasmusplus.cy and http://www.inedivim.gr/ or https://www.iky.gr

- A need to make use of each other's strengths – and to take the time to discover these and invest time thereto on networking;
- Assign clear leadership and participation in the Blue Career Centre as a whole and in rolling out the various actions. It needs to be clear who joins the initiative after the necessary consideration, and who is able to lead/take part in the elaboration and implementation of the actions;
- A need to develop a business plan/model including aspects such as finance and governance;
- It is important to preserve and build the momentum of the initiators and agree on precise timelines and milestones needed for its development and implementation.

3.4 Skills for Blue Biotechnology and Aquaculture

3.4.1 Context

Athens – Greece was the location for the fourth focus group on **Building Skills for Blue Biotechnology and Aquaculture**, aiming to promote good practices in building interdisciplinary higher education in the area of life sciences, including both biology and pharmacology (needed to address key questions in the sector including animal food and disease prevention). The focus group targeted a broader geographic range and included key stakeholders and experts from countries as diverse as Italy, Croatia, Greece, Cyprus, Egypt and Jordan. Participants from Israel and Turkey were also invited but due to last minute unforeseen reasons they could not attend. The meeting focused on the subject of integrated maritime education opportunities in the area of Blue Biotechnology and Aquaculture in the Central and East Mediterranean. Blue biotechnology of exploration and exploitation of the sea biodiversity in order to develop new products will allow development of new pharmaceuticals or industrial enzymes and consequently have high economic value. In the long term, it is expected that the sector will offer high-skilled employment and significant downstream opportunities. In parallel, marine aquaculture is a major bio-industry that has achieved a remarkable success in the Mediterranean, especially in the eastern part. The European Aquaculture Technology Platform predicts for 2030 a production growth of more than 100%, which is equal to a minimum of 4% per year. Main species will be sea bass, sea bream, sole, meagre and turbot whereas it will diversify towards functional additives and bio-energy (algae). Such technologies are crucial for the development of a wide range of Blue Economy activities. Currently, the educational and training offer catering towards these professionals and practitioners is still fragmented and much scope for international cooperation exists in this domain.

This aim and set-up was welcomed as the focus group would target the important blue biotechnology and aquaculture theme, which is a crucial part of the Blue Growth agenda and an important economic pillar in the region. Furthermore, the underlying life sciences disciplines were not yet covered by other focus groups. In particular, this field offers important opportunities for interdisciplinary educational initiatives, and much value was expected to be derived from an exchange of practices in this domain. The focus group was hosted by the National & Kapodistrian University of Athens, School of Pharmacy (Prof. Vassillos Roussis).

3.4.2 Profile of Participants

The focus group particularly targeted Adriatic-Ionian as well as East Mediterranean key stakeholders, thus securing geographic balance across the region. The participants were primarily from the blue biotechnology and aquaculture education field and included representatives from:

- The National & Kapodistrian University of Athens, School of Pharmacy, Greece (hosting organisation);
- The University of Zagreb, Faculty of Pharmacy and Biochemistry, Croatia;

- The University of Cyprus -Oceanography Center, Cyprus;
- The Agricultural Research Institute, Cyprus;
- The Suez Canal University Hospital, Suez Canal University, Egypt;
- The WorldFish Centre, Regional Centre for Africa & W/Asia, Abbassa, Abou Hammad, Sharkia, Egypt;
- The Aristotle University of Thessaloniki, Faculty of Sciences, School of Biology, Greece;
- The CNR - Istituto di Chimica Biomolecolare, Napoli, Italy;
- The University of Udine Department of Food Science, Italy;
- The Marine Science Station (MSS) Aqaba, Jordan University, Jordan;
- The Andreas Syggros Hospital in Athens, Greece.

3.4.3 Needs and Challenges

Although aquaculture and blue biotechnology seem to be quite distinct activities, aquaculture has an extremely high affinity and benefits from biotechnological improvements and applications ranging from genetics and molecular phylogenetics, to ichthyopathology and health, nutritional bioengineering (e.g. enrichment with highly unsaturated fatty acids), chemoprophylactics and quality issues. Blue biotechnology itself can exploit new metabolites and biomolecules, enzymes and genes from micro-organisms living in extreme marine habitats. These extreme ecosystems, include solar saltworks and coastal lagoons that are abundant in East Med. As the Mediterranean region hosts around 400 coastal lagoons, covering a surface of over 641,000 ha (6,410 km^2) – almost like the island of Crete – as well as inland desert and arid zones (abundant in Egypt, Israel, Lebanon and Jordan) a variety of biotechnological applications can be implemented.

The focus group identified a number of needs that include:

- Better understanding of the marine biotechnological and aquaculture opportunities especially in the area of the Central-East Mediterranean and between EU and non-EU countries.
- Bridge the gap between academia and industry;
- Facilitate young people to get a job in the biotechnology and aquaculture sector by creating career centres and by promoting the best skills & talents through rewarding excellence;
- Facilitation of young people to make theses on real industry– led problems and issues, thus facilitating the interaction between Knowledge Producing Institutions (KPI) and the industry;
- Promote and enhance the knowledge of existing employees in order to increase their capacity and knowledge and strengthen their employment positions, through e-learning;
- Strengthening the competitive advantage of the East Med for aquaculture development with enhanced networks among East Med Universities and RTD Institutions and further exchange of young students and scientists to facilitate understanding and a better knowledge of the East Med ecosystems and carrying capacity;
- The creation of a specialised Centre for non-EU participants that could act as a Support Unit (facilitator) and assist in the proposal submission for EU co-funded initiatives;
- More publicity and wider dissemination of the EU funded opportunities. An information day or a conference could greatly help boosting blue biotech and aquaculture activities in East Med.

Finding ways to overcome existing barriers for integration and cooperation

Apart from the political issues, which are intense in the region, academia and Industry are ready for cooperation that to some extent is materialised with the common participation in projects or investments from one country to another. A lot of know-how tailor-made to Mediterranean conditions has been created and this knowledge and improvement as well as best practises can

easily be shared among East Med Institutions. Joined courses could be a first step to realise this aim. Barriers and challenges include:

- Lack of collaboration culture between industry and research. We should find a way to connect research with industry and *vice versa*.
- Availability of funds is often the main problem – but it is certainly not the only one. Accessing the right people, at the right countries at the right time is very important. By using a strategy to pool resources and have access to the resources. Networks and exchanges will allow people to see trends in the various laboratories, where they are heading. This creates ideas and best practices and can result in a useful transfer of best practises when back home.
- R&D is still not a stable factor in the industry and is the first thing that is reduced when business does not do that well for a while. This has to change in order to build a stable collaboration between academia and industry.

3.4.4 Rationale for Cooperation

The focus group identified that although there is cooperation and networks among Mediterranean EU MS, a significant part and prevailing mode of collaboration is with Universities and RTDs with Northern Europe. As for non-EU Countries, the collaboration among them in East Med is not that intense and in most cases, there is collaboration with North Europe (notably UK and Germany) and USA. Non-EU Countries (Egypt, Jordan) collaborate also with the Gulf Countries (KSA, UAE, Qatar etc.) where funding opportunities for cooperation as well as the administration procedures seem to be more attractive compared to EU funding procedures.

All participants have a previous experience of international cooperation that initiated either in the framework of an EU-funded or co-funded project or in the framework of bilateral agreements (eg. Italy – Egypt). Common research interests are an important element to maintain international collaboration even beyond the limited timeframe of a project.
Following consultations with the participants it was agreed to join forces and establish a **Joint Blue Biotechnology & Aquaculture postgraduate course for the Central-East Mediterranean basin.**

The global aim of the Joint Blue Biotechnology & Aquaculture postgraduate course is to contribute to the creation of an interdisciplinary flexible programme that will allow the graduates to have a very good understanding of the marine biotechnological opportunities especially in the area of the Central-East Mediterranean.

Institutions from Croatia, Cyprus, Egypt, Greece, Italy and Jordan but also from Israel, Slovenia, Turkey and Lebanon could join forces and create a joint flexible postgraduate course that will offer educational, training and exchange possibilities among the participating institutions. The postgraduate courses can be organised into:

1) A joint Master of Science programme;
2) Summer schools;
3) Distance Learning (Lifelong education) opportunities.

The joint Blue Biotech & Aquaculture Postgraduate Course programme will aim to:

1) Bridge the gap between EU and non-EU countries in the East Med area;
2) Bridge the gap between academia and industry. The joint Blue Bio & Aqua Postgraduate Course will act as the bridge between the Knowledge Producing Institutions (KPI) and the Industry and thus by adopting suitable courses, more suitable and well-fit graduates that can be absorbed by the regional Industry will be more fitting to this purpose;
3) Facilitate young people to get a job in the biotechnology and aquaculture sector by acting as a career centre and by promoting the best skills & talents through rewarding excellence;

4) Facilitating young people to make theses on real industry– led problems and issues, thus facilitating the interaction between Knowledge Producing Institutions (KPI - Universities, Technological & Research Institutions) and the industry;
5) Promote and enhance the knowledge of existing employees in order to increase their capacity and knowledge and strengthen their employment positions, through e-learning.

3.4.5 How to make it work?

The implementation of the Joint Blue Biotechnology & Aquaculture postgraduate course programme will be performed by expert members of the focus group participants as well as invited professors of other Departments of domestic or accredited foreign Universities, as well as other categories of teaching staff. The existing facilities of the KPIs listed above will be used for the operation of the joint postgraduate courses. The selected candidates will pay tuition fees and this will safeguard the sustainability through time.

The purpose of the programme is the training of post-graduate students in Aquaculture and Blue Biotechnology issues related to coastal and marine resources of the Eastern and Central Mediterranean, as well as the planning of management programmes to preserve biodiversity and the sustainable exploitation of natural resources. These aims will be achieved through lectures by scientists-academics from diverse scientific disciplines, such as Hydrobiology, Marine Biology and Ecology, Environmental Economy, Marine Biotechnology and Molecular Biology as well as pharmaceutical, nutraceutical, and cosmeceutical sciences combined with natural resource management and the legislation governing their use in coastal areas. The curriculum and applications for practical training in the field will enable post-graduate students, after the completion of their studies, to have a better understanding of the opportunities for aquaculture and biotechnological applications in the East and Central Med area and how to utilise and apply best practises in each Country (EU and non EU).

The Curriculum of the Blue BioTech M.Sc. programme

The Blue BioTech M.Sc. programme consists of four six-month modules/semesters. The first semester corresponds to 30 ECTS and consists of core courses related to environmental aspects of aquaculture, the legal framework from different East Med countries, innovation and technologies in aquaculture, protected Marine Areas and Anthropogenic Impacts on Coastal Environments, biodiversity as a source of innovation and development and Marine Natural Products and Biotechnology. The core courses of the second semester correspond to 30 ECTS and are related to Fish Quality and Welfare, Marine Spatial Planning (MSP) of Aquaculture - Estimation of Carrying Capacity, Remote Sensing, Remote Monitoring and Geographical Information Systems (GIS), use of biotechnology and molecular techniques for Risk Assessment of aquatic ecosystems, Diagnostic Applications of Biotechnology and exploitation of living resources in coastal lagoons and saltworks.

The Blue BioTech M.Sc. programme gives the opportunity to students to choose one elective course (C1-C4) for completion of ECTS of second semester related to aquaculture or biotechnology issues. Moreover, the elective courses **promote student's mobility** and give the opportunity to move in a country of the other collaborating universities and attend the corresponding elective courses. Specifically, if the Lead institution will be in Greece, the semesters will be based there and the students who will choose course C1 (aquaculture value chains in East Med) will move to Egypt, C2 (Ecosystem-Based Management: Practical Application and Challenges) will move to Cyprus to attend the corresponding lectures whereas the students who will choose course C3 (Biomolecular research on fish immune system and applied research on vaccine development) and

C4 (Physiological Marine Genetics: Tools and Concepts) will move to Italy to attend the corresponding lectures. Each elective course is based on specific scientific background and provides specific knowledge in the area of aquaculture or blue biotechnology.

The core courses of the third semester correspond to 30 ECTS and are related to Nutrition and Feed formulation, Finfish and shellfish biotechnology, and micro and macroalgae exploitation: chemistry, bioactivity and applications. The Blue BioTech M.Sc. programme gives the opportunity to students to choose one elective course (E1-E4) for completion of ECTS of the third semester related to aquaculture or biotechnology issues. Again, the elective courses promote student's mobility and give the opportunity to move in another Country to an affiliated University or Institution, to attend the corresponding elective courses. Specifically, the students who will choose course E1 (Environmental Impact Assessment for Aquaculture Projects) could move to Italy, for E2 (Sustainable management in Mediterranean coastal lagoons: interactions among capture fisheries, aquaculture and the environment) must be moved to Egypt to attend the corresponding lectures whereas the students who will choose course E3 (Biotechnological potential of solar salt works and ecological management) could move to Israel and for E4 (Aquaculture: the blue biotechnology of the future?) could move to Jordan to attend the corresponding lectures.

The fourth semester module is related to dissertation of students and to presentation of their Master Thesis and corresponds to 30 ECTS. Students will be able to select a domestic or foreign laboratory to carry out their dissertation, with the agreement of the corresponding professors. Students can carry out their Master Thesis on several topics ranging from molecular biology, ichthyopathology, screening of bioactive marine metabolites to management and eco-innovation. The aim is to address relationships between East Med ICZM, biodiversity exploitation, environmental friendly and sustainable aquaculture, production of microalgae and macroalgae and biotechnological applications.

The summer school of the Joint Blue Biotechnology & Aquaculture postgraduate course for the Central-East Mediterranean

The collaborating Universities and Institutions of the Joint Blue Biotechnology & Aquaculture postgraduate course may pull together experts to organise targeted **summer schools** (**SS**) on innovative aspects of aquaculture and blue biotechnology that will be addressed to the aquaculture and biotechnology industry and postgraduate students. The SS can be organised in the premises of the collaborating Universities and Institutions from EU and non-EU countries and will have 10 days duration (including a weekend).

During the course, challenges and opportunities within the area of aquaculture and/or blue biotechnology will be discussed, tailor made for East Med. 15-20 lecturers from the hosting university and the collaborating one's will contribute to the course. The objective of the SS is to gather an international group of selected postgraduate students of different disciplinary backgrounds around selected topics of Aquaculture and Blue Biotechnology. Through lectures from distinguished scientists within the field, attendees will be presented with tools to address challenges and specific problems within different aspects of the selected topics. The attendees will be provided multiple opportunities to interact with invited scientists and learn from each other and build networks which will be of benefit in the future.

As part of the course assignments, each student can present a poster describing the most important aquaculture and/or blue biotechnology issues of today and for the future based on their own research and geographical area perspective. The language of instruction will be English. The SS will be addressed to post-graduate students associated with the collaborating universities, whose research is directly related to some aspect of aquaculture and blue biotechnology as well as

to employees of companies related to the above areas. Preference could be given to PhD students. In the absence of suitable PhD candidates, universities may put forward final year Masters students or Junior scientists/instructors, if their research interests are in line with the topic. Candidates will be invited after selection to participate in the SS. It is envisaged that a maximum of 25 participants will attend (Course credits: 5 ECTS). There will be a Course fee to cover accommodation, local travel, and meals for international students.

The Distance Learning (Lifelong education) opportunities of the Joint Blue Biotechnology & Aquaculture postgraduate course for the Central-East Mediterranean

The existing IT infrastructure of the participating Universities for provision of distance learning, tailor made to aquaculture and biotechnology in the East Med region can be used for those wishing to get started down a blue biotechnology or aquaculture career path without any prior biology or biotechnology experience and may want to consider pursuing such a certificate degree programme. These certificates can be obtained through continuing education distance learning programmes and can be achieved in a relatively short time. When earned through an accredited programme, these certificates may be sufficient for the holder to earn a job as a laboratory or research technician or as technical personnel in an aquaculture enterprise. Those with higher aspirations in biotechnology may consider an associate's degree that will provide additional research skills and technical knowledge. Computer based education is designed to provide total access in higher education to more citizens for both graduate and post-graduate level. Knowledge, new technology, innovations and ICT services can be effectively diffused in the East Med with the implementation of various programmes for distance education, remote seminars, professional training, corporate training and the support of new professional horizons for graduates.

3.4.6 Conclusions and lessons learnt

The above offer can provide an important boost to the development of sustainable aquaculture practices in the East Med, and have these innovate through blue biotechnology. The course is expected to provide an important step towards the creation of knowledge and competences in this field, and contribute towards the creation of high-quality jobs in the field. Nevertheless, and building on previous experiences in assessing such joint Master's programmes under the Erasmus Mundus programme, it is important to take into account certain lessons when n setting up such a scheme.

- A joint Master's programme will be more successful in case of existing trust and cooperation among the institutes and persons involved; if these links are yet to be developed, it is important to take some time to better understand each other's strengths and interests, and invest in cooperation and networking;
- A joint Master's programme can be more feasible if the number of partners involved is limited; if interest to cooperate is wider, one can consider to elaborate the programme with a number of core partners and extend it to other institutes;
- The sustainability of the programme will depend amongst others on the ability to charge cost-based tuition fees; however the ability of students to pay such fees is expected to differ across the region, hence a policy needs to be set up on how to address this differentiation (e.g. scholarships, reduced tuition fees, etc);
- All elements of the programme need to meet quality standards, and it should be prevented that the reputation of the programme is compromised by particular weak modules;
- The Erasmus + programme appears to be a suitable vehicle for developing such a programme.

- Sufficient attention will need to be paid to the marketing of the programme in the region, e.g. through dedicated channels, professional organisations, conferences, websites, etc.

It is important to preserve and build the momentum of the initiators and agree on precise timelines and milestones needed for its development and implementation.

3.5 Exploring education and training cooperation opportunities in navigation safety

3.5.1 Context

Genoa – Italy, was the fifth location to host a focus group. The city of Genoa hosts several institutions that play a key role in the development of the maritime sector in the region, while being particularly active in cooperation activities as well as in the provision of training. Moreover, its prestigious maritime legacy as well as strategic connection to several major maritime locations in the Mediterranean sea made the Ligurian capital an ideal meeting location for exploring cooperation potential among maritime stakeholders.

The focus group targeted the subject of international cooperation in the areas of maritime education and training in the Mediterranean sea basin. Specific attention has been given to three specific sectors: maritime security, maritime safety and the protection of the marine environment. While security and safety issues were central in the exchanges, the protection of the environment has been only briefly mentioned. These sectors are of the highest importance in ensuring the safe use of the sea and in securing maritime borders. The improvement and optimisation of maritime surveillance activities, including their interoperability at the international level, are of crucial importance to meeting the challenges and threats relating to safety of navigation, marine pollution, law enforcement and overall security.

The focus group was hosted by the Genoa Coastguard Training Centre "C.A. Antonio De Rubertis", which plays a pivotal role in ensuring ad hoc training notably in the areas of safety of navigation and maritime transport.

3.5.2 Profile of Participants

Participants to the focus group were representing a variety of EU and non-EU institutions, such as:

- The Genoa Coastguard Training Centre;
- The International Maritime Safety, Security and Environment Academy (IMSSEA);
- The University of Genoa;
- The Mediterranean Institute of Maritime Training (IMFMM) in Tunisia;
- The Tunisian Naval Academy;
- The University of Tangier, Morocco;
- The Holy University of Kaslik, Lebanon.

3.5.3 Needs and Challenges

The need for enhanced cooperation across the Mediterranean Sea basin in the area of MET

Since the Limassol Declaration, growth and jobs have been put at the core of fundamental initiatives such as Blue Growth and the Integrated Maritime Policy (IMP). In 2010, the latter was extended to the EU neighbouring countries to promote an integrated approach to maritime affairs to maximise the use of the sea whilst maintaining a viable sustainable environment. In this context, several meetings and workshops for relevant Ministries and public bodies were organised to discuss and agree on common priority areas for intervention. In the context of the 12th FEMIP

Conference dedicated to the blue economy and to marine and maritime cooperation, participants from the EC, EIB as well as IMP countries indicated the need to establish a network providing exchange and cooperation opportunities, matchmaking activities as well as the general attractiveness of blue careers. It is therefore crucial to capitalise on the current political momentum which ensures that cooperation in the area of MET is high on the political agenda of IMP countries.

The mismatch of skills

Overall, those stakeholders who were contacted during the different phases of the project agreed in pointing to a mismatch between offer of skills and demand of the market. Agreement is however only apparent since substantially different perspectives were highlighted by stakeholders depending on their location (i.e. sub-sea basin level) and by stakeholder category (private, public and MET stakeholders). The most striking dissimilarities concerned the Maritime Economic Activities which were pointed as suffering from a mismatch, thus making it difficult to prioritise between for instance innovative and traditional maritime activities.

Education and training: a mixed picture of competencies and key actors

National differences and specificities dominate education and training in maritime security and safety, whit the responsibility for the provision of education and training in security and varying greatly depending on the country. It can be provided by public or private organisations, being more focused on higher education or, conversely, focusing on vocational education and training.

Involvement of the private sector can be beneficial

Industry representatives often believe that education and training providers are not fast enough in following up with the real needs of the industry. However, what should not be underestimated are the costs linked to the development, conceptualization and implementation of courses and trainings. There is hence a rationale for including the private sector in the process leading to the development of competencies for maritime security and safety. It is however of crucial importance to ensure that the development of competencies responds to the general interest and not to ad-hoc, selected interests. In this sense, public authorities need to accompany such processes, also by bringing a more forward-looking perspective to the process.

Lack of a pan-Mediterranean network to identify needs and solutions to common MET challenges

At Mediterranean level, potential for international cooperation exists, notably in the form of collaborations where resources and expertise can be pulled together to benefit participants. However, no multilateral platform sharing maritime education and training needs actually exists. A networking structure is needed for stakeholders to be aware of similar MET needs across the sea basin, which could potentially call for shared solutions and further synergies in how maritime education and training is developed in the Mediterranean. Moreover, structured dialogue opportunities between the business sector, decision-makers and the education & training providers would be an opportunity to ensure further coordination across actors and thus address the mismatch between offer and demand of skills.

3.5.4 Rationale for Cooperation

All along project implementation, the great majority of stakeholders showed honest interest and considerable support for strengthening cooperation and networking in maritime education and training. Despite having been selected and gathered around sectorial themes such as maritime

security and safety, participants to the Genoa focus group pointed to challenges and needs which are often similar, if not shared, across several maritime sectors. Collectively, they expressed the need for a comprehensive, pan-Mediterranean approach which could take the form of a 'forum', which is to be intended as a structured opportunity for dialogue among stakeholders with the aim to identify and address maritime education and training needs. Such structure should be able to capture and at the same time overcome the complexity and variety of maritime education and training governance in the Med. In Genoa, this structure has been identified as **the Mediterranean Forum for Maritime Education and Training**.

The Forum should be able to preserve and reinforce existing collaboration ties, which often transcend the sub-regional dimension. Indicatively, participation to the Forum should attempt at adopting a so-called **'triple helix approach'**, where education&training providers, industry and government are brought together in a coordinated way in order to develop concrete and coherent solutions to MET needs. Moreover, involvement of national decision-makers is considered both a pre-condition and a critical element to ensure the participating Member States' buy in and support to the Forum initiative.

More concretely, the Forum would positively contribute to addressing the following issues:

1) Contribute to the development of concrete collaboration opportunities between and among EU and non-EU countries;
2) Create an environment of trust and collaboration among participants;
3) Facilitate the exchange of ideas, experiences and practices;
4) Bring together public and private stakeholders from the education and VET world;
5) Encourage the identification of the needs of individual organisations and existing networks in terms of courses, teaching material, infrastructure, etc.;
6) Promote the sharing of experiences as well as the development of shared solutions to concretely tackle common needs;
7) Provide concrete responses to the mismatch of skills between education & training and the maritime industry.

As far as sectorial specialisation is concerned, **all Maritime Economic Activities could potentially be covered by the Forum's activities**. This choice would have the advantage of recognising the frequent cross-sectorial nature of maritime activities, as well as the synergies that can occur within maritime value chains.

In terms of geographical scope, **the Mediterranean region is believed to be the appropriate level where international cooperation could occur**. Stakeholders across the Mediterranean have in fact established collaborations (often project-based) with actors that are not necessarily located in the same sub-sea basin. Indeed, collaboration at the Mediterranean level could have the advantage of facilitating links between and among EU and non-EU countries, as well as across sub-sea basins. Nevertheless, the flexibility of the Forum's structure could occur at times along the lines of geographical sub-sea basins, or depending on the sectorial focus of the sub-committees

3.5.5 How to make it work?

This section provides a few ideas on how the Forum could be structured so to ensure a well-functioning multi-level and effective governance. It should be stressed that the below structural elements are to be intended as mere suggestions which would benefit from a more throughout reflection, also on the basis of the feedback from the validation workshop.

High Level Group

As the governing body of the Mediterranean Forum, it is responsible for developing and implementing **the Memorandum of Understanding** (MoU) which would constitute the founding document regulating the Forum's governance, membership and overall objectives. A few suggestions can be made at this stage:

- The MoU needs to clearly indicate the objectives of the Forum, namely the development of specific professional skills as well as the agreement on the methods of certification through which such skills will be recognised by the Forum's members;
- The High Level Group should reflect the varied nature of its members, thus including representatives from the High Education, VET, the business sector as well as decision-makers;
- The MoU should establish the frame and rules within which the Forum will operate. These include membership, governance, financing and overall objectives. Rules regarding the presidency and the related voting rules should also be clearly indicated.

The Secretariat

A Secretariat could be needed to coordinate the work of Forum and provide secretarial support. A call for proposals could be launched by the European Union to subcontract such role to one external organisation, which would ensure the appropriate independence and managerial skills to facilitate exchanges and ensure that the MoU is properly implemented. Alternatively, secretariat functions could be ensured by the country ensuring the Forum's presidency.

The secretariat would be in charge of the day-to-day management of the Forum and coordination of the Forum's activities and periodical meetings. To do so, part of the financial resources directed to the Forum would need to be devoted to administration and management.

The Industry Group

Composed by members of the maritime industry, it would have a consulting role to steer and oversee the identification and update of those skills mentioned in the Memorandum of Understanding. Certainly, the development of skills needs to mirror the strategic present and future needs of the maritime industry in terms of competencies. Members of this group could be national chambers of Commerce, as well as the main European and non-European trade unions. Indeed, further analysis should be conducted to establish the most appropriate level(s) of participation (European, national, regional, local).

At national level, Chambers of Commerce as well as trade unions would be encouraged to consult with their individual members regarding their needs in terms of sectorial skills. We suggest to carefully consider the direct participation of individual industrial stakeholders, as certain countries would be overrepresented and thus influence the outcome of discussions towards skills that might not be crucial for the overall sector.

National/Regional Groups

National and Regional Groups would be set up at national level to facilitate early exchanges as well as the fine-tuning of national positions vis-à-vis MET needs in specific industrial sectors and areas. They would be responsible for collecting needs and ideas emerging in MET, making sure that at least one national member (for VET and/or higher education) sits in each of the Working Groups (see below). The creation as well as the establishment of these National/Regional groups would be managed by each participating country. Eventually, the running the secretariat of the Forum could be charged of designing a 'template' for establishing national Memorandums of Understanding.

Working Groups

Working Groups would represent the **'living and evolving' assemblies of the Forum**. Each Working Group (WG) would correspond to a specific Maritime Economic Activity. Additional ad hoc Working Groups could be set up to facilitate exchanges and identify needs on specific cross-sectorial issues, such as security and safety of maritime personnel, marine and maritime pollution, maritime infrastructure, etc. Each WG could bring together representatives of those institutions and organisations that are in charge of delivering MET at their level of responsibility (national regional, European, etc..). WG would also be attended by at least one member of the High Level Group as well as by the Industry Group, which would preferably be given an observatory role only.

To a certain extent, Working Groups might not necessarily be reflecting the whole Mediterranean spectrum. For instance, certain skills shortages or MET needs might be more prominent in certain sub-sea basins or between EU or non-EU countries only. In this sense, Working Groups would express the **flexible nature of the Forum** by adapting membership to the needs of certain geographical areas or group of countries. For instance, they would encourage regional cooperation among non-EU countries in the Adriatic-Ionian as well as in the southern neighbouring countries.

The most important element would be the solution-oriented nature of such gatherings, so to meet two fundamental objectives: participating organisations and institutions gather to exchange views on the needs of a particular sector; however, the exchanges would also need to focus on bringing forward solutions and possibly allocating responsibilities among those organisations willing to provide practical help.

Sustainability and EU added value

The results emerged so far in the context of this study indicated that one of the reasons why 'project-based' networks of cooperation cease their activities is the lack of financial resources to ensure their long-term sustainability. This observation suggests that, should a network such as the Forum be put in place, its resources should be ensured independently from the availability of support from a specific donor like the European Union. As a consequence, a membership system should be put in place, including a transparent method for the collection of participation fees. These could be made mandatory at country level or, eventually, at organisational level. Nevertheless, the setting of the fee amount might have an impact on the type and number of individual organisations willing to participate to the Forum.

Fees could cover:

1) The right to be part of the National/Regional Working Groups, which represent the necessary intermediate membership to access the Forum's Working Groups at Mediterranean level;
2) The contracting and running of secretarial and organisational support;
3) The maintenance of the Forum's website;
4) The holding of Working Group meetings and any other ad hoc meeting that participants wished to hold. This could also include the coverage of travel and accommodation of participants;

As far as a potential involvement of the European Commission is concerned, this could consist of financing an exploratory project to assess the feasibility as well as the detailed characteristics of the Forum. In addition to this, there seems to be a case for keeping the secretariat function separated from the membership of the Forum. In this sense, the European Commission could be responsible for the tendering of the secretariat/organisational support, including its direct contracting and resourcing. By doing so, the European Commission would be able to ensure that the necessary support is ensured to the Forum, while avoiding that any individual interest strives the process or

influences the Forum's daily functioning. Moreover, much added value is seen in having the European Commission steer the process which will eventually lead to the signature of a Memorandum of Understanding among the participating countries. The European Commission is in fact the linking dot between and across several EU level as well as extra European regional and international for a and thus occupies a privileged position when it comes to prompting participation as well as ensuring coherence and synergies between different initiatives.

3.5.6 Conclusions and lessons learnt

The following actions are, in our view, recommendable to ensure the setting-up as well as the sustainability of the Forum:

1) Ensure political support to the initiative among EC, EIB and IMP participating countries. The backing of the countries that firstly raised the need for enhanced and structured networking opportunities is a *conditio sine qua non*. Countries bordering the Mediterranean basin would need to engage themselves in the facilitation of both cooperation and coordination of facilities;
2) Clear commitment would have to be secured among those countries which would benefit from but also give support to the Forum, namely the countries active in the IMP-MED programme;
3) Steer a process which would aim at agreeing on a Memorandum of Understanding which would establish the Forum's objectives, a transparent and fair method for the collection of participation fees (as well as the level at which these should be collected), the Forum's governance as well as a list of indicative MET tools which could be used for training purposes. The Memorandum of Understanding could also include a set of rules and guidelines to ensure that practical solutions to MET needs are not only proposed, but also implemented. Finally, a proper evaluation and feedback mechanism should be put in place to ensure that the Forum meets the objectives included in the Memorandum of Understanding as well as in the Terms of Reference for secretarial and organisational support;
4) Develop Terms of Reference for a feasibility study which would look into the characteristics and operational needs of the Forum. It is at this stage that the geographical as well as sectorial scope of the Forum should also be defined;
5) Gather the necessary experts and interest representatives to develop a coherent, forward-looking list of skills needed to ensure the development and sustainability of the blue economy in the Mediterranean sea basin. A balance would need to be reached between industrial interests and the feasibility of actions needed from the MET side to meet such needs;
6) Develop terms of reference to ensure the Forum is assisted on a daily basis through secretarial as well as organisational activities. The contractor/member organisation in charge of supporting the Forum would need to be made responsible of the following activities:
    a) Organisation of physical meetings to support the operational creation of solutions to the participants' needs (technical assistance, event organisation);
    b) Support to the moderation of WG gatherings;
    c) Provision of competent, up-to-date and needs-based advice in support to the realisation of the objectives indicated in the Memorandum of Understanding, notably regarding skills and recognition of qualifications;
    d) Development and creation of an external website to promote the involvement of stakeholders;
    e) Set-up a virtual forum for stakeholders to identify needs and potential solutions before the holding of Working Groups;

f) Hosting, within the Forum's website, of a "Virtual Knowledge Centre" on Maritime Education and Training allowing for the sharing of relevant available general, technical and sectorial information in the region;

g) Ensuring the visibility of the Forum through the regular publication of newsletters presenting the activities of the Forum, including an events' calendar.

4 Conclusions and recommendations: a 'Passage Plan'

"A Passage Plan shall be made before departure and prepare all the necessary charts (berth to berth) for the intended voyage (www.shipsbusiness.com)"

This final chapter structures conclusions and recommendations around two main sections:

- Firstly, the key findings emerged throughout the study. Their acknowledgment is considered a prerogative for the successful and sustainable reinforcement and creation of networks of maritime education and training in the Mediterranean;
- Secondly, the 'Passage Plan' presents key principles for future action that are then further elaborated through concrete recommendations addressed to both international institutions as well as to pratictioners on the ground.

4.1 Key findings from the study

Maritime education and training in the Mediterranean: a very complex and fragmented landscape

According to our own mapping analysis, the number of educational and training institutions located in countries bordering the Mediterranean Sea is 355[40], and they are located in a range of 21 Mediterranean countries. A total of 40 % of the mapped organisations focuses on only one Maritime Economic Activity, while the remaining 60 % deliver education to more than one MEA. The focus in education and training in the maritime sector seems to be on the traditional sectors and seafarers, and less so on on-shore subjects. At the off-shore side one sees a very strong sense of pride within the workforce, along with strong international regulations and standards. In some cases these standards prevent institutions to innovate and expand beyond the traditional disciplines.

The mapping exercise and the subsequent research has demonstrated the complexity of maritime education and training in this area due to:

- The variety of maritime economic sectors involved, such as (nautical and coastal) tourism, maritime engineering (shipping, ports, energy sector), coast guard and security (including monitoring) as well as life sciences required for advancing aquaculture, fisheries and biotechnology;
- The geographic diversity and big distances across this large-scale sea basin; the distance between Gibraltar in the west to Beirut in the east exceeds that from Gibraltar to Denmark;
- The differences between EU and non-EU countries, not only in terms of socio-economic development but also in the means and feasibility of traveling (e.g. visa requirements) and formal and informal recognition of skills and qualifications;
- The coverage of both higher as well as vocational education systems, both of which are different in terms of set-up and remit;
- The number and diversity of institutions involved; varying from mainstream universities and dedicated maritime academies to sectoral organisations and employer's organisations, public authorities, ministries, employment agencies, etc. that provide education as part of their activities;

[40] Organisations for which it was not possible to determine the MEA were excluded

- The national specificity of educational systems, including the differences between public and private sector involvement<. In some countries, maritime education and training is primarily provided by the state, while in other countries the private sector plays a key role, with all gradients in between. Since the mixture of stakeholders involved in the provision of education and training is highly dependent on the national education system, it is important to take such differences into account when attempting to build cooperation.

The maritime education and training offer appears rather traditional – and does not fully match the requirements of tomorrow's Blue Economy

Existing curricula offered in the Mediterranean sea basin are rather traditional and conventional, and are not necessarily adjusted to the needs of the modern Blue Economy. As a result, commercial initiatives have been taken not only within the region but also outside the region [41], in an attempt to close existing gaps. Although such opportunities are helping to respond to the needs of the maritime economy, mostly so in the area of shipping, they do not help with building a modern, state-of-the art maritime education and training offer in the region, not with developing skills kin smaller but upcoming blue sectors.

A landscape consisting of both project-based as well as structural initiatives

The study shows that there is no central database with an overview of all providers of training in the Mediterranean in the maritime sector. Without such a database, it is difficult to build an overview of all such education and training initiatives and of cooperation in the Mediterranean. Our own inventory has pointed to fourteen networks operating in the Mediterranean in the field of maritime education and training. Of these, several are EU-funded and project-based and most of them have come to a close already: AQUA-TNET -the European Thematic Network in the field of aquaculture, fisheries and aquatic resources management) and Vasco da Gama are prominent ones. Many of the project-based initiatives identified depend largely on EU funding mechanisms as the source for their set up – which provides challenges with regard to sustainability.

Other, more structural bodies include the European Coast Guard Functions Forum and the MariFuture - European Platform for Maritime Education, Research and Innovation – both initiatives have been described as part of the case study derived from the Genoa case study. They are important initiatives to take into account, however they appear not to be specifically geared towards the broader maritime education and training offer in the Mediterranean. MariFuture appears to focus mostly on commercial offering and has only weak links with public education institutes.

Cooperation is more focused on higher education – VET is less covered

Existing international networks are mainly active at the higher end of education, with VET hardly being present. Higher education institutes (universities) tend to have a strong international network that focuses on new topics. However their prime focus for cooperation often lies more in research than on education: offering training courses is not their key focus. This inhibits transfer of knowledge and innovation to enterprises.

Networks or more stable institutional cooperation are also mapped and examples involving a wide array of themes can be evidenced in the Mediterranean sea basin, involving mainly higher education entities (with very few VET providers).

[41] See http://www.marifuture.org/Partners.aspx

Although most of the training offer concerns VET, the international cooperation in VET is not as strong as in higher education – which is more internationalised already. There are multiple reasons for this, and the fact that skills and qualification recognition is more advanced in the higher education (the Bologna process) is certainly one of them.

A number of training institutions have a strong international network and some provide training as part of global training initiatives – following international standards. Private institutions are often better capable to cooperate with enterprises. Also the prime focus on certification and traditional skills may inhibit innovation.

Maritime education and training is expensive – due to high capital costs

Overall, maritime education and training involves high capital costs – required for the necessary infrastructure including teaching materials, training simulators, laboratories, vessels, etc. The financing structure for the sector is vulnerable. Longer term investments are needed as the current training offer is often outdated and not following pace with the technological developments in the sector. Cooperation offers concrete opportunities for economies of scale, sharing and pooling of resources.

Nevertheless, a strong interest in cooperation and integration exists

Despite the complexity, the interest in cooperation amongst Mediterranean maritime education and training providers appears strong. A wide range of similarities, synergies, challenges and concerns has been identified, and confirmed the willingness of stakeholders to cooperate on overcoming these. The strong interest in cooperation was confirmed by the willingness and ability of five organisations in the region to co-host the focus groups, and to do so at high professional standards. It has also been confirmed by the strong interest from participants to join such focus groups – despite long travel distances and time investments required. This can be considered an important indicator for the feasibility of any follow-up activity.

Cooperation efforts are complicated by a number of issues

Efforts to cooperate in maritime education and training are often faced with a range of barriers, of a structural and/or practical nature:

- Variation in the national characteristics of maritime education and training, including its public or private nature;
- Mutual recognition of qualifications. Maritime education systems responds to a national system of academic job titles and academic reconnaissance. For example, a person that studies in the UK will be granted with a British academic title that will not be recognised in France, whereas in France, North African titles are more recognised as they are more or less similar to the French system;
- Insufficient capitalisation on past experiences. For example, choice of a wrong cooperation framework and underestimation of the sustainability issue;
- Lack of understanding and interest in the maritime sector among mainstream institutions and education organisations;
- Financial barriers which do not allow the continuation of cooperation unless new funding schemes are made available; difficulties in ensuring the continuation of project-based networks of collaboration in the long-term;

Weak cooperation between North and South parts of the basin

From our analyses of existing education networks it is clear that the linkages between educational institutions with the countries on the opposite side of the Mediterranean sea basin are still weak and in many cases non-existent. Many obstacles exist also in terms of admission of students and visa requirements. There is a need for specific programmes that foster mobility with third countries in

education and research, as well as common methods for the recognition of qualifications in the maritime sector. This requires full confidence in the capacities, employability and performance of workers from across the sea basin.

Feasibility of promising existing and emerging bottom-up initiatives has been explored

This project has identified and assessed various existing and emerging initiatives and acted as a facilitator in their further development and visibility. Existing initiatives that have been highlighted were VET On Board ('Marinate' the nautical training offer, emerging from the focus group in Barcelona, Spain) the Malta Maritime Forum and Malta Marittima, based on the focus group in Valletta, Malta). New initiatives that have been actively facilitated are the Blue Career Centre for the Eastern Mediterranean (based on the focus group in Larnaca, Cyprus) and the Blue Biotechnology & Aquaculture Postgraduate Course for the Central-East Mediterranean basin, based on the focus group in Athens, Greece.

4.2 A 'Passage Plan' for maritime education and training in the Mediterranean sea basin

Table 4-1 The 'Passage Plan' in a shapshot - principles and recommendations

Principles for action:	
1. A need to increase attractiveness, modernisation and innovation; *2. Cooperation according to the triple helix is needed;* *3. Think 'global' and act 'local';* *4. Capitalise on existing or past experiences;* *5. Establish sustainable forms of cooperation right from the start.*	
Recommendations for EU, international and national policy makers: 1. Establish a Forum for Maritime Education and Training in the Mediterranean; 2. Utilise the Union for the Mediterranean Framework; 3. Build on existing cooperation – from the Mediterranean and beyond; 4. Promote the visibility and take-up of existing programmes, initiatives and funds; 5. Tailor mainstream programmes, funds and initiatives to the maritime education and training needs in the Mediterranean.	**Recommendations for maritime education and training practitioners:** 1. Align quality standards across the Mediterranean; 2. Target real needs; 3. Carefully establish the right framework conditions; 4. Pool resources; 5. Build on experiences gained; 6. Engage with the private sector; 7. Develop Blue Career initiatives; 8. Create joint programmes and summer schools; 9. Explore E-learning opportunities. 10. 'Marinate' existing VET curricula

4.2.1 Principles for future action

Based on the analysis to date, and taking into account the experiences gained with maritime education and training cooperation in the Mediterranean, a number of principles can be formulated which serve as guidance for future action:

- Principle 1: A need to increase attractiveness, modernisation and innovation;
- Principle 2: Cooperation according to the triple helix is needed;
- Principle 3: Think 'global' and act 'local';
- Principle 4: Capitalise on existing or past experiences;
- Principle 5: Establish sustainable forms of cooperation right from the start;

Principle 1: A need to increase attractiveness, modernisation and innovation

Cooperation can provide impulses to modernisation and innovation – cherishing the practical nature of the employers' needs in this domain. In this respect, the maritime education and training offer in the Mediterranean appears not fully up to date, compared to the needs of the industry. IMO standards, applying to part of the maritime professions, do not always help to bring about such innovation and they might not automatically catch up with reality.

For example, linkages between education and the labour market can be strengthened through apprenticeship schemes. The off-shore training in the maritime sector is often built around these schemes: 1 year to school, 1 year on a ship. In that sense the maritime sector has already quite some experience with this type of training. One could expand these schemes also for less traditional topics in the maritime sector, thus enhancing attractiveness of the sector and increasing the number of people entering the sector.

Principle 2: Cooperation according to the triple helix is needed

All three parts of the helix (private sector, public authorities and education providers) are needed around the table – especially so for VET. There appears an overall willingness to do so, but there is no 'one size fits all'. What matters is that the cooperation takes place. It does not matter who will lead.

Principle 3: Think 'local' and 'global'

Engaging with local actors can bring real value to education and training initiatives, while ensuring that objectives are actually met. Moreover, private actors such as Small and Medium Enterprises will more likely engage in initiatives that are closer to their range of activities, needs and interests. At the same time, international best practises, new technologies and innovative actions can be adopted in the Mediterranean area allowing the involved stakeholders to be well aligned to international standards, globalisation and be better prepared to the international competition.

Principle 4: Capitalise on existing or past cooperation initiatives

Some initiatives carefully build on each other, e.g. the initiative to establish a Blue Career Centre for the Eastern Mediterranean is much-welcomed and needed. It builds on existing initiatives such as the cooperation between the Maritime Institute of the Eastern Mediterranean and the Arab Academy of Sciences, Technology and Maritime Affairs. Therefore, it can draw on experiences and resources already in place – such as the Blue Career Days held for several years in a row on Cyprus already.

Principle 5: Establish sustainable forms of cooperation right from the start

An important aspect lies in the time frames used: building up cooperation in education and training is a long-term affair. However, projects co-funded by EU programmes are nowadays one of the main instruments used by education institutions at the time of carrying out transnational cooperation activities. Exclusively project-based approaches may not be the best way forward. They can lead to discontinuity and interruption of capacity building efforts and a 'stop and go' approach. Such cooperation models are often built on projects/project funding, and thus vulnerable for their continuity on temporary funding. This means also a challenge for re-designing EU funding mechanisms – they need to take into account the sustainability dimension, exit strategies, etc.

4.2.2 A 'Passage Plan' for EU, international and national policy makers

Building on the above principles, a number of recommendations are made to EU, international and national policy makers:

- Recommendation 1: Establish a Forum for Maritime Education and Training in the Mediterranean;
- Recommendation 2: Utilise the Union for the Mediterranean Framework;
- Recommendation 3: Build on existing cooperation – from the Mediterranean and beyond;
- Recommendation 4: Promote the visibility and take-up of existing programmes, initiatives and funds;
- Recommendation 5: Tailor mainstream programmes, funds and initiatives to the maritime education and training needs in the Mediterranean.

Recommendation 1: Establish a Forum for Maritime Education and Training in the Mediterranean

The main aim for cooperating at the Mediterranean level is to overcome skills mismatches and aim for more openness across countries. To do so, stakeholders should come together to openly discuss needs and solutions in the area of maritime education and training.

All along project implementation, the great majority of stakeholders consulted within the context of this project showed sincere interest and considerable support for strengthening cooperation and networking in maritime education and training. Collectively, they expressed the need for a comprehensive, pan-Mediterranean approach which could take the form of a 'forum', which is to be intended as a structured opportunity for dialogue among stakeholders with the aim to identify and address maritime education and training needs. Such structure should be able to capture and at the same time overcome the complexity and variety of maritime education and training governance in the Med - a Mediterranean Forum for Maritime Education and Training. Such a forum should be able to capture and at the same time overcome the complexity and variety of maritime education and training governance in the Med.

The Forum should be able to preserve and reinforce existing collaboration ties, which often transcend the sub-regional dimension, and include existing relevant cooperation initiatives. Participation to the Forum should follow a 'triple helix approach', where education & training providers, maritime industry as well as relevant government bodies are brought together in a coordinated way in order to develop concrete and coherent solutions to needs of the Blue Economy.

More specifically, the Forum would positively contribute to addressing the following issues:

1) Contribute to the development of concrete collaboration opportunities between and among EU and non-EU countries;
2) Create an environment of trust and collaboration among participants;
3) Facilitate the exchange of ideas, experiences and practices;
4) Bring together public and private stakeholders from the education and VET world;
5) Encourage the identification of the needs of individual organisations and existing networks in terms of courses, teaching material, infrastructure, etc.;
6) Promote the sharing of experiences as well as the development of shared solutions to concretely tackle common needs;
7) Provide concrete responses to the mismatch of skills between education & training and the maritime industry.

Recommendation 2: Utilise the Union for the Mediterranean framework

The Union for the Mediterranean (UfM) has a broad membership basis of 40 countries, including both EU and non-EU countries. Its role is increasingly recognised in areas such as employment, education and sustainable development.

The UfM has started to step up its role in the maritime domain since the Declaration on the Blue Economy (November 2015). This was followed-up by the establishment of a Blue Economy Working Group, which already met successfully on 17th May in Turku, Finland and which is expected to have a meeting every semester. It will focus on a wide range of themes of relevance to the promotion of the Blue Economy across the Mediterranean sea basin.

The UfM Secretariat and the European Commission are currently discussing the mission and structure of a UfM Platform for Dialogue on the Blue Economy. The above proposed Mediterranean Forum for Maritime Education and Training could be one of the UfM Blue Economy Working Group's components.

Ad hoc committees would represent the 'living and evolving' assemblies of the Forum. Each Working Group (WG) would be focusing on one specific theme/issue/challenge. On an annual basis, the UfM Blue Economy Working Group would discuss and identify one or more focus areas around which *ad hoc* committees would be created. Each committee could bring together representatives of those institutions and organisations that are in charge of delivering MET at their level of responsibility (national regional, European, etc.), as well as policy makers and the industry. The advantage of *ad hoc* committees is that they can be dissolved once the task completed, leaving room for new initiatives. The most important element would be the solution-oriented nature of such gatherings, so to meet two fundamental objectives: identifying solutions to shared needs and recommend concrete actions for implementing solutions.

Recommendation 3: Build on existing initiatives – from the Mediterranean and beyond

Existing cooperation between maritime educational and training institutes in the Mediterranean remains scarcely addressed and insufficiently known and explored. However, those initiatives already present and working need to be recognised. A best practice in that respect is the Arab Academy for Science, Technology and Maritime Transport that involves 39 organisations of different kind from 22 Arab countries.

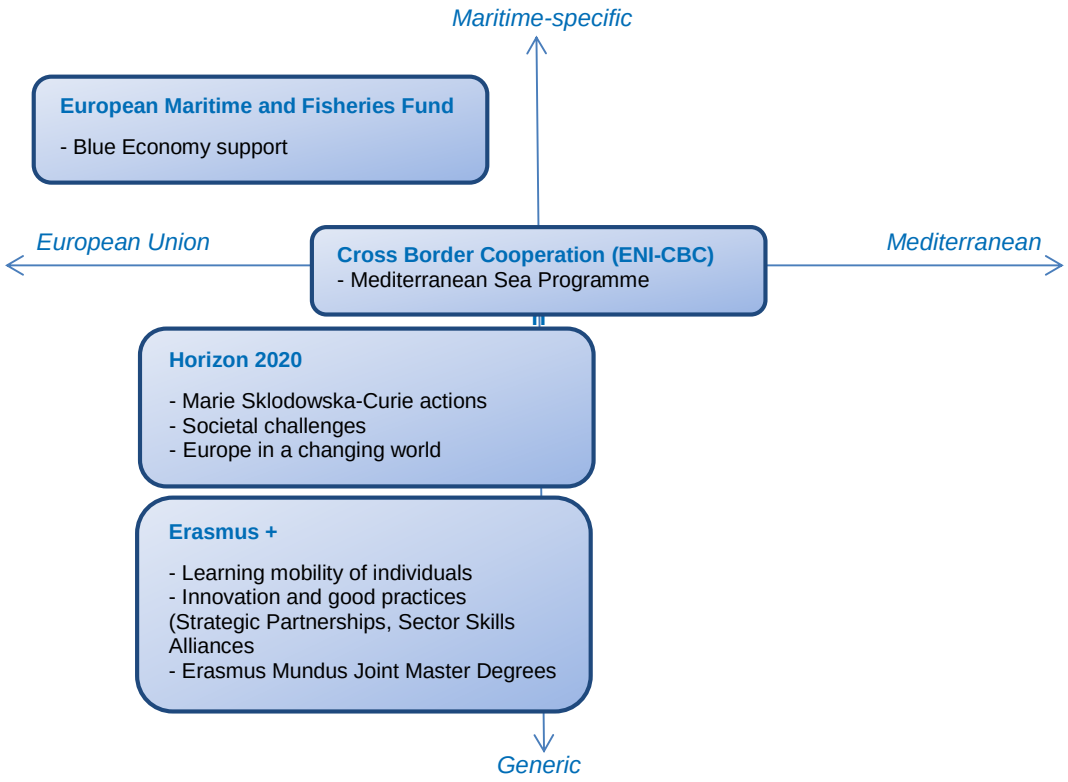
A number of projects have been set up in Europe which focus on maritime-specific training and which constitute relevant sources of inspiration, good practices as well as potential collaborating partners and models for the Mediterranean countries.

As relevant models and examples, the Northern Maritime University Network project consisted of university and industry partners from five countries around the North Sea, and aimed at creating a collaborative network of universities, institutions, maritime industry and related organisations in order to enhance the European maritime business sector by delivering teaching and qualifications that correspond to the industry's needs and expectations. This project resulted in 2 e-learning modules in Cross-cultural management and an executive module in Human Factors – Maritime Safety and Health issues. Similarly, the KNOWME project is a European academic and industry network for innovative maritime training, education and R&D. Funded by FP7, it was set up to address the growing shortage of maritime professionals which could result in decreased competitiveness of the European maritime (transport) industry. Its primary objectives were to maintain and enrich the knowledge capital of the European maritime sector, improve opportunities for innovative education and training and carry out research with regards to improving the image of the maritime sector.

Recommendation 4: Promote the visibility and take-up of mainstream programmes, funds and initiatives (such as Erasmus +)

Actors from the maritime world often consider their challenges 'unique'. However, this turns out to be only partially true as many of these challenges apply to the Mediterranean sea basin as a whole. This project has identified a number of existing and new promising bottom-up initiatives, and these as well as similar initiatives can in principle be supported by some of the existing EU mainstream programmes and initiatives – notably Erasmus +. However, such support mechanisms are not often known to the maritime education and training experts on the ground – and therefore it is important to increase their visibility amongst these target groups (see Figure 4.1 below).

Figure 4-1 Overview of funding opportunities for supporting maritime education and training initiatives in the Mediterranean



The figure above indicates the different EU funding opportunities that can support education and training initiatives in the EU and in the Mediterranean, as well as those having a specific maritime dimension. Different funding opportunities are placed according to their areas and fields of action Some funds are available only to EU Member States, while others allow for the participation of third countries. Also, funds and programmes can target only maritime initiatives or aim at more generic content. It should be noted that the Integrated Maritime Policy for the Mediterranean (IMP-MED) has not been included, as it does not include funds that countries can directly apply for.

The **European Maritime and Fisheries Fund (EMFF)**, one of the five EU Structural & Investment Funds, supports Blue Growth projects. A part of the EMFF[42] is dedicated to the implementation of the EU Integrated Maritime Policy (IMP). Some projects related to research and education may allow non EU-Member States to participate. In April 2016, a call for proposals for cooperation project for Blue Labs[43] open to third countries has been launched to support the Blue Growth

[42] http://ec.europa.eu/fisheries/cfp/emff/index_en.htm
[43] https://ec.europa.eu/easme/en/funding-opportunities - downloaded 20th May 2016

strategy as well as the Blue Technology[44] call. As for the 'Blue Careers' call [45], it was launched around the same period but is not open to non-EU countries.

Horizon 2020 is the biggest EU Research and Innovation programme. In the frame of Horizon 2020, the Marie Skłodowska-Curie actions[46] (MSCA) can help improving research and skills in the marine and maritime sectors. MSCA proposes a range of grants to support researchers mobility, training networks, and exchange of research and innovation staff to EU Member States and Horizon 2020 associated members (Mediterranean countries except Israel). The programmes Societal Challenges and Europe in a changing world include funds for projects related to Blue Growth[47] (mainly research) or the creation of research network networks[48].

Erasmus+ targets education and training notably. Its key activities include support to learning mobility of individuals and to enhancing innovation and to sharing good practices between organisations. Erasmus has a European Neighbourhood component aiming at promoting modernisation and opening up of higher education. Much relevant experience in educational mobility and exchange is crystalised in the Erasmus+ Programme[49], which is open to both EU and non-EU countries. Several maritime programmes have already been supported under Erasmus+, and experiences and soundness have been confirmed by now. In particular the Erasmus Mundus Joint Master Degrees Programme appears a promising vehicle, and several maritime programmes have already been developed through this mechanism.

The European Neighbourhood Instrument - Cross Border Cooperation (ENI-CBC) "Mediterranean Sea Basin"50 Programme was adopted by the European Commission on 17 December 2015 to support public and private cross-border integration (including education) projects. A first call for proposals for a total amount of €84,6 million51 is currently under preparation. This Cross-Border Cooperation programme forms part of the European Neighbourhood Instrument and allows the creation of north-south partnerships across the basin.

Recommendation 5: Tailor mainstream programmes, initiatives and funds to the needs of maritime education and training in the Mediterranean

Several barriers exist, however, to the successful support of Mediterranean education and training projects in the framework of the above-mentioned EU funding schemes:

- Mediterranean actors often find it challenging to compete with actors from other sea-basins; this is often due to the weaker knowledge base and/or the fragmented nature of education and training institutes in the region; as a consequence it can be more strategic for them to look for partners outside the region;
- Non-EU Member States can often not take part in EU initiatives; one of the most recent EMFF Calls for proposals (Blue Careers) is not open to non-EU Member States – thus further limiting the potential of cooperation across the region;
- Maritime initiatives need to compete with mainstream initiatives; dedicated maritime academies and/or training institutes often have less critical mass and therefore less capacity to respond to such calls than other actors.

[44] https://ec.europa.eu/easme/en/call-proposals-blue-technology-transfer-innovative-solutions-sea-basin-economies
[45] https://ec.europa.eu/easme/en/call-proposals-blue-careers-europe
[46] https://ec.europa.eu/programmes/horizon2020/en/h2020-section/marie-sklodowska-curie-actions
[47] http://ec.europa.eu/research/participants/data/ref/h2020/wp/2016_2017/main/h2020-wp1617-food_en.pdf p96
[48] Call closed in April 2016
[49] http://ec.europa.eu/programmes/erasmus-plus/sites/erasmusplus/files/files/resources/erasmus-plus-programme-guide_en.pdf
[50] http://www.enpicbcmed.eu/
[51] http://www.enpicbcmed.eu/communication/euro-mediterranean-cooperation-first-meeting-joint-monitoring-committee-marks-operatio

Therefore, a need has emerged to specifically promote the take-up of both Mediterranean and maritime initiatives within the context of mainstream EU funding mechanisms. This can be done through two ways:

a) Launching specific calls – e.g. Horizon 2020 calls on the Mediterranean;
b) Tailoring eligibility criteria to the interests and/or actors from the Mediterranean.

4.2.3 A 'Passage Plan' for maritime education & training practitioners

Complementary to the above-mentioned recommendations for policy makers, the following recommendations are made for practitioners:

- Recommendation 1: Align quality standards across the Mediterranean;
- Recommendation 2: Target real needs;
- Recommendation 3: Carefully establish the right framework conditions;
- Recommendation 4: Pool resources;
- Recommendation 5: Build on experiences gained;
- Recommendation 6: Engage with the private sector;
- Recommendation 7: Develop Blue Career initiatives;
- Recommendation 8: Create joint programmes and summer schools;
- Recommendation 9: Explore E-learning opportunities;
- Recommendation 10: 'Marinate' existing VET curricula.

Recommendation 1: Align quality standards across the Mediterranean

Cooperation among stakeholders, and notably work that is collectively carried out across Mediterranean countries should be implemented following the same quality standards and criteria. Thus, a prerequisite for cooperation in maritime education and training is that a student attending half of his degree in Lebanon and another one in Spain would be assured that the education received in both countries is of the highest standards, and his degree is recognised across the sea basin. Therefore, a mechanism must be in place in order to evaluate and rank the relevant Academic and VET institutions of the Blue Growth Maritime Economic Activities (MEAs) in a transparent way – e.g. working with credits that can be swapped.

Recommendation 2: Target real needs

A good cooperation framework should always start with a problem/needs/gaps analysis as this will ensure the consistency, the relevance and the effectiveness of the potential future network or cooperation project, as this will enable that the cooperation framework or network will remain focused on key priorities and objectives. Indeed, cooperation should focus on those areas where it can bring real benefit. Real needs are different across the various segments of the Blue Economy, and between West, Central and East Med. In mature MEAs like shipping and coastal tourism, the private sector must play a pivotal role in cooperation initiatives. In emerging MEAs such as Blue biotechnology, Ocean energy, etc., public authorities have a larger role to play – they can provide the initial incentives to stimulate cooperation with start-ups or already established companies with such a segment in their portfolio.

Recommendation 3: Carefully establish the right framework for cooperation

Cooperation starts with finding the right partners, and for doing so, a number of elements need to be taken into consideration:

- Choice of the right geographical level for partnership;
- Strategic partner choice – is there really enough that binds together?
- Find out about good practice before approaching partners;
- Check competencies of partner organisations – are they really similar?
- Share ownership, commitment and responsibilities;
- Set among the partnership realistic ambitions – exchange of experience/learning.

Any network or cooperation framework should also pay particular attention to ensuring coherence with the relevant national and regional policies of the bodies participating, and the expected outcomes or achievements of working as a network will have to be targeted to those priorities.

Recommendation 4: Pool resources

Cooperation in the maritime sector needs to be based on a map of available resources and facilitate the shared use of facilities, such as training facilities, training ships, simulators, large marine research infrastructure[52], etc. Priority should be given to facilitating access to resources needed for the development of skills in new technologies. The proposed Mediterranean Forum for Maritime Education and Training can certainly play a role to coordinate this mapping. For pooled resources, collective management can work better than pure government management or private management[53]. Goods that are generally considered to be "public goods" yield non-subtractive benefits that can be enjoyed jointly by a larger target group.

Recommendation 5: Build on experiences gained

Working as a network intrinsically means looking ahead with the objective of finding and developing new solutions. It is important not to invest time and resources in overlapping activities or in working on initiatives that have already been developed or which are being taken forward. There are also valuable experiences and a wealth of good practices in running and implementing cooperation schemes through EU funded programmes, notably Erasmus +, Horizon 2020, the 2007-2013 ENPI CBC MED multilateral cross-border cooperation programme or the various INTERREG programmes that need to be taken into consideration.

Recommendation 6: Engage with the private sector

The maritime industry, including its SMEs, has a key role to play in pushing for increased innovation and modernisation of the education and training offer. The triple helix approach to cooperation (private sector, public authorities and education & training providers) is the right format for doing so. However, it requires the definition of common standards and shared goals. It is crucial to address the mismatch between the offer and demand of professional profiles providing the right job skills to meet the requirements of a very high demanding industry, and this can only be done with an active involvement of the public sector, the private companies and the education community to jointly design, develop and implement new programmes (or adapting already existing ones) capable to meet the market needs and requirements.

Recommendation 7: Develop Blue Career initiatives

There is a need to bring industry and education and training providers together to promote and support the development of career opportunities in the Blue Economy. A new generation of students, scientists, professionals, technicians and entrepreneurs need to be equipped with the appropriate skills to match the needs of the industry and to provide people already working in the field with the new skills required. To this end the recent call of EASME for Blue Careers in Europe[54] goes in the correct direction although future calls should include also partners from non-EU Countries in order to better stimulate cooperation, serving the needs of the local or regional labour market and of the industry.

By way of example, 'Blue Career Centres' can fill the gap in the lack of information on career opportunities, or lack of awareness on seas and oceans matters, which also has an impact on public perception and on the appeal of maritime careers. Raising students' awareness, from

[52] See: https://ec.europa.eu/research/infrastructures/pdf/toward-european-intagrated-ocean-observation-b5_allbrochure_web.pdf

[53] Ostrom E: *Understanding institutional diversity*. Princeton University Press, Princeton; 2005

[54] https://ec.europa.eu/easme/en/call-proposals-blue-careers-europe

secondary school to higher education, about the wide variety of education and training opportunities leading to maritime jobs is therefore key to enhancing the visibility and attractiveness of the Blue Economy for the younger generation across the Mediterranean Sea. The “Blue Career Centre for the Eastern Mediterranean” – as proposed during the Larnaca focus group can serve as an inspiring example that deserves to be implemented and replicated.

Recommendation 8: Create joint programmes and summer schools

Teams across sub-regions in the Mediterranean Sea can collaborate and create joint education and training activities in various Blue Growth sectors that can be organised into either joint Masters of Science programmes or summer schools. The Joint Blue Biotechnology & Aquaculture Postgraduate Course, proposed in the Athens Focus group (see section 3.4), is an example of such an initiative that could also attract some seed funding from the Erasmus + programme. Joint efforts of Knowledge Producing Institutions focusing on common sub-region challenges and issues, can support future workforce in Blue Economy sectors in need of specific professional profiles/skills/qualifications in the local, regional or cross-border context.

Recommendation 9: Explore E-learning opportunities

The Mediterranean sea-basin is extremely large and travel costs related to physical cooperation can be high. In this context, it is important to explore opportunities for E-learning – at least for a number of theoretical building blocks for which such physical presence is not required. In the context of this project, the Institute of International Nautical Studies in cooperation with the Maritime College of Athens has taken an initiative to explore such E-learning opportunities, and it is important to make further progress in the area of distance learning.

Recommendation 10: ‘Marinate’ existing VET curricula

Rather than creating *ad hoc* curricula, another way to innovate is to use existing curricula. In VET, this relates for example to carpenters, electronics or hostelry – curricula that can all be adapted to the specificities of the sea-environment. Meant by this is that profession(al)s of the sea are integrated in the regular training programmes – however they need to be adapted as “to be a carpenter in a big ship is not the same as being a carpenter in a big house”. This process of ‘marinating’ is also regarded as more efficient than just establishing brand new nautical (VET) curricula.

Study supporting a possible network of maritime training academies and institutes in the Mediterranean Sea basin

Annexes

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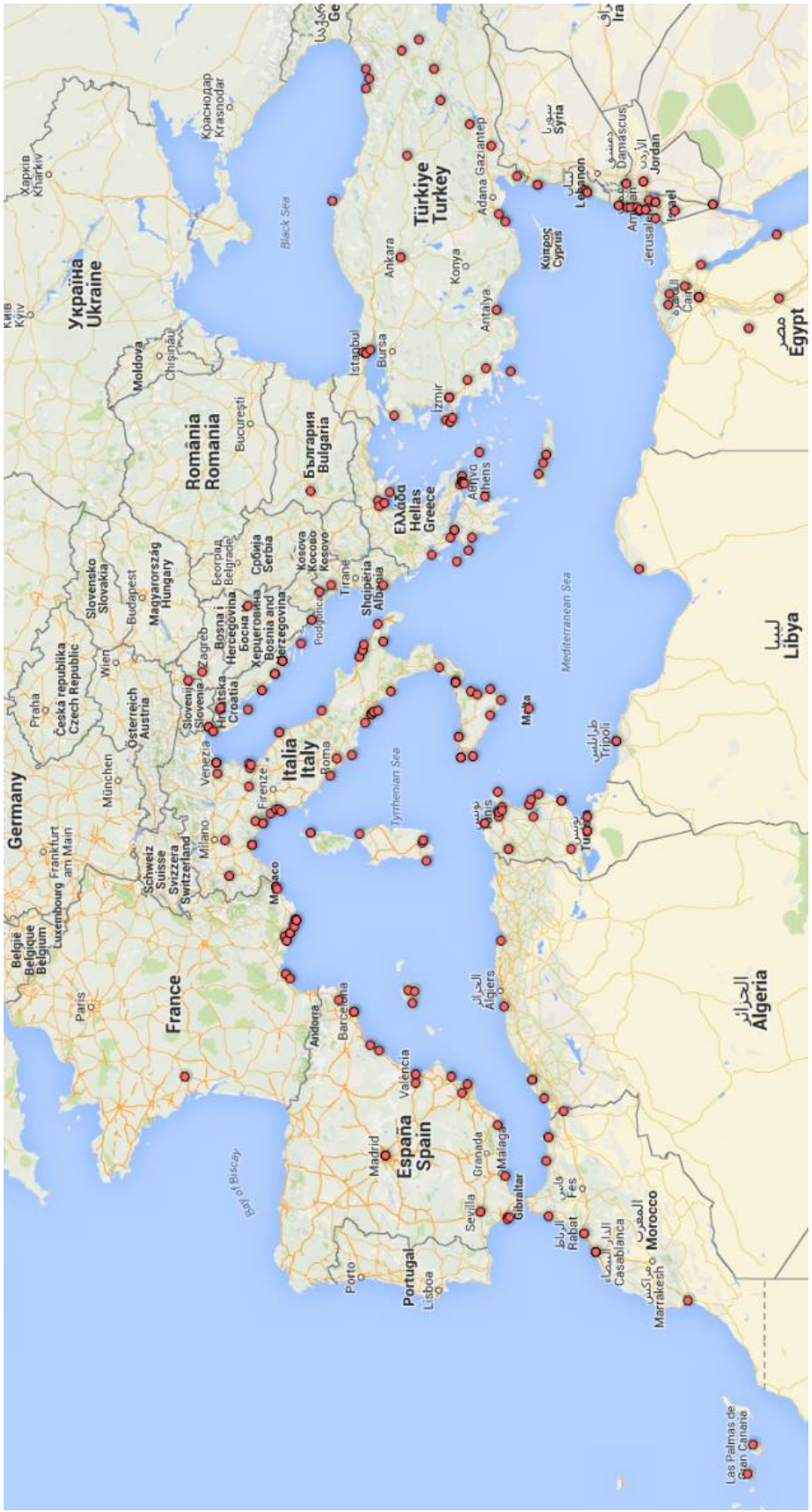
Annex 1: Mapping of Education Providers



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Annex 2: Mapping of existing international cooperation and networks operating in the Mediterranean Sea basin

To illustrate the different types of networks identified, we present a sample of each of these networks identified, by presenting the main members of each network. We identified three types of relevant networks: those in education, those related to maritime economic activities and a large number of project based networks.

Networks focused on education

Association of African Universities (AAU)

- Ain Shams University (Egypt)
- American University in Cairo (Egypt)
- Al-Azhar University Cairo (Egypt)
- Alexandria University (Egypt)
- Assiut University (Egypt)
- Cairo University (Egypt)
- Mansoura University (Egypt)
- Menoufia University (Egypt)
- Minia University (Egypt)
- MISR University for Science & Technology (Egypt)
- October 6 University (Egypt)
- South Valley University (Egypt)
- Suez Canal University (Egypt)
- Tanta University (Egypt)
- Zagazig University (Egypt)

Association of Arab Universities (AARU)

- Ain Shams University (Egypt)
- Alexandria University (Egypt)
- Assiut University (Egypt)
- Université Senghor d'Alexandrie (Egypt)
- Jordan University of Science and Technology (Jordan)
- University of Jordan (Jordan)
- Lebanese University (Lebanon)
- Notre Dame University (Lebanon)
- University of Balamand (Lebanon)
- Al-Azhar University (Palestine)
- Bethlehem University (Palestine)
- Birzeit University (Palestine)

AquaForMed of water training centres

Leading organisation:

- Institut International de l'Eau et de l'Assainissement - ONEE/IEA – Rabat (Morocco)

Members:

- Ecole Supérieure de Management des Ressources en Eau (ESMRE) Oran (Algeria)
- AgroParisTech - Insitut des Sciences et des Industries du Vivant et de l'Environnement - Paris- Montpellier (France)
- Office International de l'Eau - OIEau - Paris – Limoges – Nice (France)
- Centre
- International des Technologies de l'Environnement de Tunis (CITET) (Tunisia)

EfVET - European forum of VET

All the member states are involved: public and private sectors, national associations, consortia of colleges and schools, companies with training departments, individuals and public TVET bodies.

EUN (Egyptian Universities Network)

- Cairo University
- Alexandria University
- Ain Shams University
- Assuit University
- Tanta University
- Mansoura University
- Zagazig University
- Helwan University
- Minia University
- Menofia University
- Suez Canal University
- SVU
- Fayuom University
- Beni Suief
- Benha University
- Kafr El-Sheikh University
- Sohag University
- Azhar University

EuroMed Permanent University Forum EPUF

- Ain Shams University (Egypt)
- Alexandria University (Egypt)
- Jordan University of Science and Technology (JUST) (Jordan)
- Notre Dame University (Lebanon)
- University of Balamand (Lebanon)
- Birzeit University (Palestine)
- University of Malta (Malta)
- Cyprus University of Technology (Cyprus)
- University of Cyprus (Cyprus)
- University of Patras (Greece)
- Ghent University (Belgium)
- University of Liège (Belgium)
- Sapienza University of Rome (Italy)
- University of Catania (Italy)
- University of Trieste (Italy)

Federation of the Universities of the Islamic World (FUIW)

- Alexandria University (Egypt)
- Ain Shams University (Egypt)
- Assiut University (Egypt)
- Minia University (Egypt)
- Université Senghor d'Alexandrie (Egypt)
- Suez Canal University (Egypt)
- Helwan University (Egypt)
- Tanta University (Egypt)
- Zagazig University (Egypt)
- Cairo University (Egypt)
- Mansoura University (Egypt)
- Minufiya University (Egypt)
- Al al-Bayt University (Jordan)
- Al-Balqa` Applied University (Jordan)
- Ajloun National Private University (Jordan)
- Al-Ahliyya Amman University (Jordan)
- Al-Hussein Bin Talal University (Jordan)
- Al-Isra University (Jordan)
- Al-Zaytoonah University of Jordan (Jordan)
- American University of Madaba (Jordan)
- Applied Science Private University (Jordan)
- German-Jordanian University (Jordan)
- Hashemite University (Jordan)
- Irbid National University (Jordan)
- Jerash Private University (Jordan)
- Jordan University of Science and Technology (JUST) (Jordan)
- Jadara University (Jordan)
- Mutah University (Jordan)
- Petra University (Jordan)
- Philadelphia University (Jordan)
- Princess Sumaya University for Technology (Jordan)
- Tafila Technical University (Jordan)
- University of Jordan (Jordan)
- World Islamic Sciences and Education University (Jordan)
- Yarmouk University (Jordan)
- Zarqa Private University (Jordan)
- Al-Imam Al-Ouzai University for Islamic Studies (Lebanon)
- Beirut Arab University (Lebanon)
- Islamic University of Lebanon (Lebanon)
- Lebanese University (Lebanon)
- Al-Azhar University Gaza (Palestine)
- An-Najah National University (Palestine)
- Al-Quds University (Palestine)
- Al-Quds Open University (Palestine)
- Birzeit University (Palestine)
- Al-Khalil University (Palestine)
- Islamic University of Gaza (Palestine)
- Selçuk Üniversitesi (Turkey)
- Van Yüzüncü Yıl Üniversitesi (Turkey)

- Gazi University (Turkey)

International Association of Universities (IAU)

603 universities: http://www.iau-aiu.net/content/institutions

KILL SPILL

Leading organisation:

- Technical University of Crete, School of Environmental Engineering (Greece)

Members:

- Bangor University (United Kingdom)
- Ulster University (United Kingdom)
- University of Newcastle Upon Tyne (UNEW) (United Kingdom)
- Geological Survey of Denmark and Greenland (GEUS) (Denmark)
- University of Copenhagen (Denmark)
- Ghent University (Belgium)
- University of Applied Sciences and Arts (FHNW) (Switzerland)
- University of Bologna (UNIBO) (Italy)
- Sapienza University of Rome (UNIRM) (Italy)
- National Research Council (CNR) (Italy)
- University of Milan (Italy)
- Spanish National Research Council (CSIC) (Spain)
- University of Chemistry and Technology (ICTP) (Czech Republic)
- German Research Center for Environmental Health (HMGU) (Germany)
- The State University of New York at Buffalo (US)

Mediterranean Universities Network for Education for Sustainable Development (MedUnNet)

Leading organisation:

- University of Athens (EL)

Members:

- Agricultural University of Athens (EL)
- Akdeniz University (TURKEY)
- Frederick University
- La Sagesse University (LEBANON)
- National & Kapodistrian University of Athens (EL)
- Panteion Universityof Social & Political Athens (EL)
- Technical University of Catalonia (ES),
- University of Agriculture of Tirana (ALBANIA)
- University of Bordeaux 3 (FR), University of Cairo (EGYPT)
- University of Crete
- University of Cyprus
- University Mohamed V Souissi (MOROCCO)
- University of Padova (IT)
- University of Peloponnesus, University of Primorska (SI)
- University of Sarajevo (B-H)
- University of Tunis
- University of Zagreb (HR)

SYLFF Network (SYLFF)

Leading organisation:

- The Tokio Foundation

Members:

- American University in Cairo (Egypt)
- Ben-Gurion University of the Negev (Israel)
- National and Kapodistrian University of Athens
- University of Jordan (Jordan)

MEA Networks

CIHEAM

- IAM Bari
- IAM Chania
- IAM Montpellier
- IAM Zaragoza

IAMU (International Association of Maritime Universities)

Leading organisation:

- Nippon Foundation

Members:

- Arab Academy for Science and Technology and Maritime Transport (Representing Africa)
- Australian Maritime College (Oceania)
- Cardiff University (Western Europe) [now replaced by Polytechnical University of Catalonia, Faculty of Nautical studies, Barcelona]
- Dokuz Eylül University (Turkey)
- Istanbul Technical University, Maritime Faculty (Mediterranean, Black Sea, ex Central and Eastern Europe)
- Kobe University of Mercantile Marine (Asia) [now transformed to Kobe University, Faculty of Maritime Sciences]
- Maine Maritime Academy (Americas including the Caribbean's)
- University of Split (Croatia)
- World Maritime University (General representation)

ECGFF- European Coast Guard Functions Forum

Leading organisation:

- Finnish Border Guard

Erasmus Mundus Master Course on Maritime Spatial Planning (EMMCMSP)

Leading organisation:

- Università Iuav di Venezia (Italy)

Members:

- University of Sevilla (Spain))
- University of Azores (Portugal))

European Network of Maritime Clusters (ENMC)

Leading organisation:

- Luxembourg Maritime Cluster

MIO-ESCDE

126 members from 26 countries

Vasco da Gama project, WP1 Training for maritime safety

Leading organisation:

- CPMR
- Members:
- Academy Merchant Marine in Argostoli (Greece)
- Università Iuav di Venezia (Italy)
- Hochschule Bremen, University of Applied Sciences (Germany)
- Lithuanian Maritime Academy, Klaipeda (Lithuania)

Other members:

- European Transport Workers'Federation

- Oceano XXI (Portugal)

CEDARE - Water Resources Management programme

Leading organisation:

- Center for Environment and Development for the Arab Region and Europe (CEDARE)

Members:

- ABU Dhabi fund for development
- African ministries council on water (AMCOW)
- Arab centre for the studies of arid zones and dry lands (ACSAD)
- Arab fund for economic and social development (AFESD)
- Arab organisation for agricultural development (AOAD)
- Arab water council (AWC)
- Barcelona municipality
- CARE international, Economic and social commission for western Asia (ESCWA)
- European environment agency (EEA)
- European commission (EC)
- EUCC the coastal Union
- Food and agriculture organisation (FAO)
- Global water partnership (GWP)
- Institute for water education (UNESCO-IHE)
- International fund for agricultural development (IFAD)
- International center for advanced Mediterranean Agronomic studies (CIHEAM)
- INTERNATIONAL CENTER FOR AGRICULTURAL RESEARCH in the dry areas (ICARDA)
- Islamic Development bank (IDB)
- League of Arab states (LAS)
- Marseilles Municipality
- Mediterranean commission for sustainable development (MCSD)
- MEDCITIES
- Regional organisation for the conservation of environment of the red sea and gulf of Aden (PERSGA)
- Sahara and Sahel observatory (OSS)
- Southern African regional development center (SARDC)
- United nations convention to combat desertification (UNCCD)
- United nations environment programme (UNDP)
- United nation development programme (UNDP)
- World bank (WB)
- World recourses institute (WRI)
- WORLD WATER COUNCIL (WWC)
- World conservation monitoring centre (WCMC)
- World meteorological organisation (WMO)
- United nation educational, scientific and cultural organisation (UNESCO)
- Regional organisation for the protection of the marine environment (ROPME) amongst several other partners

Project based cooperation

2Fish: Inclusion of secondary service professions within fishery to the formal VET system

Leading organisation:

- Central Denmark EU office (Denmark)

Members:

- Fisheries Training Center (Denmark)
- North Cape Maritime College (Norway) and Upper secondary school
- INFORCOOP (Italy)
- Confraria De Pescadores De Lira (Spain)
- Lonxanet (Spain)
- AquaTT (Ireland)

ACT's (Avoiding Collisions aT Sea)

Leading organisation:

- Marifurture/ Centre for Factories of the Future (C4FF)

Members:

- University of Rijeka (Croatia)
- Pomorska škola (maritime school) Mali Lošinj (Croatia)
- Spinaker (Slovenia)
- Piri Reis University (Turkey)
- Centre For Factories Of The Future (United Kingdom)
- Nicola Vaptsarov Naval Academy (Bulgaria)
- Sea Teach S.L. (Spain)

An E-Learning system for GMDSS (EGMDSS) (Marifuture)

Leading organisation:

- Spinaker (Slovenia)

Members:

- Consorzio Armatori per la Ricerca - The Ship-owners Research Consortium (Italy)
- Polytechnical University of Catalonia (Spain)
- University of Cadiz (Spain)
- IDEC S.A (Greece)
- University Polytechnic de Catalunya (Spain)
- Maritime Institute Willem Barentsz
- Maritime University of Szczecin
- Satakunta University of Applied Sciences
- TUDEV Institute of Maritime Studies (Turkey)

CAPTAINS (Communication and Practical Training Applied in Nautical Studies) (Marifuture)

Leading organisation:

- University of Aegean (UoA) (Greece)

Members:

- Centre for Factories of the Future (C4FF)
- Piri Reis University (Turkey)
- TUDEV Institute of Maritime Studies (Turkey)
- The 1st Evening Vocational Senior School of Egaleo (EPAL) (Greece)
- University of Cadiz (Spain)

COMmunication and CAPitalization of the Maritime Integrated Approach in the Mediterranean Area – COM&CAP MarInA-Med

Leading organisation:

- Government of Catalonia (Spain)

Other members:

- Arco latino (Italy)
- Regione Molise
- CRPM (Conference of Peripheral Maritime Regions of Europe)

European Boat Design Innovation Group (EBDIG) (Marifuture)

Leading organisation:

- Coventry University (United Kingdom)

Members:

- Piri Reis University (Turkey)
- Genoa University (Italy)
- Chalmers University of Technology (Sweden)
- University College Dublin (Ireland)

Other members:

- BMT-Nigel Gee (United Kingdom)
- Human Solutions GMBH (Germany)

EURO TRANS LOG

Leading organisation:

- AFT Association pour le développement de la Formation professionnelle dans les Transports (France)

Members:

- DEKRA Akademie GMBH (Germany)
- NIVE-National Institute of Vocational and Adult Education (Hungary)
- Collège Economique 'ION GHICA' (Romania)

Other members:

- Unione interporti riuniti (Italy)
- FOREM-Office Wallon de la Formation Professionnelle et de l'Emploi (Begium)
- Ministerio de Educacion y Ciencia-MEC (Spain)
- UGT Federacion Regional de Transportes y Comunicaciones (Spain)
- Skills for Logistics (United Kingdom)
- FTA-Freight Transport Association (United Kingdom)

FISHPOPTRACE

Leading organisation:

- Bangor University - Environment Centre Wales (United Kingdom)

Members:

- Danish Institute for Fisheries Research
- Technical University of Denmark (Denmark)
- University OF Padova (Italy)
- Universidad Complutense de Madrid (UCM) (Spain)
- Katholieke Universiteit Leuven (K.U.Leuven) (Belgium)
- University OF Bologna (Italy)
- University of Bremen (UNI.HB) (Germany)
- TRACE Wildlife Forensics Network
- Département Sciences & Techniques Alimentaires Marines (IFREMER) (France)
- University of Aarhus (Denmark)

Other members:

- Spanish National Foundation of Fish and Seafood Processors (ANFACO-CECOPESCA) (Spain)
- The Centre of Molecular Genetic Identification (VNIRO)
- National Agricultural Research Foundation (NAGREF)

IMPACT (Integrated Maritime Promotion ACTion) (Marifuture)

Leading organisation:

- Centre for Factories of the Future (C4FF)

Members:

- Piri Reis University (Turkey)
- TUDEV Institute of Maritime Studies (Turkey)
- Spinaker maritime education company (SPIN) (Slovenia)
- Satakunta University of Applied Sciences (SUAS) (Finland)
- National Maritime College of Ireland (NMCI) (Ireland)

Integral Training in European Marinas

Leading organisation:

- Port Institute Foundation for Studies and Cooperation of the Valencian Region-FEPORTS (Spain)

Members:

- Federación Nacional de Puertos Deportivos y Turísticos (Spain)
- Federación Europea de Marinas y Puertos de Recreo (Spain)
- EUROMARINA (Spain)
- Association Nazionale per la Nautica da Diporto ASSONAUTICA (Italy)
- INNOREG (Hungary)

MACOMA

Leading organisation:

- University of Cadiz (Spain)

Members:

- University of Bologna (Italy)
- University of Algarve (Portugal)
- University of Aveiro (Spain)
- RUSSIAN STATE HYDROMETEOROLOGICAL UNIVERSITY (Russia)
- University Plymouth (United Kingdom)

Other members:

- ABENGOA
- Golder Associates Ltd

M'AIDER - Maritime Aids' Development for Emergency Responses (Marifuture)

Leading organisation:

- Maritime Institute Willem Barentsz (MIWB) (The Netherlands)

Members:

- University of Strathclyde (United Kingdom)
- TUDEV Institute of Maritime Studies (Turkey)
- Lithuanian Maritime Academy (Lithuania)
- Centre for Factories of the Future (C4FF) (United Kingdom)
- Spinaker (Slovenia)
- IDEC S.A. (Greece)

MarEng Plus (Marifuture)

Leading organisation:

- University of Turku, centre for Maritime Studies (Finland)

Partners:

- Kymenlaakso University of Applies Sciences (KYAMK) (Finland)
- Åland University of Applied Science (ÅMA) (Finland)
- Lingonet Oy (Finland)
- University of Antwerp, Institute of Transport and Maritime Management Antwerp (UA, ITMMA) (Belgium)
- Cork Institute of Technology – National Maritime College of Ireland (NMCI) (Ireland)
- Latvian Maritime Academy (LMA) (Latvia)
- Shipping and Transport College Rotterdam (STC-Group) (the Netherlands)
- Gdynia Maritime University (GMU) (Poland)
- University of La Laguna (ULL) (Spain)

Advisory partners:

- Emergency Services College (Finland)
- Lithuanian Maritime Academy (Lithuania)
- Ceronav Maritime Training Centre (Romania)
- Maritime and Fishing Polytechnic School (Spain)
- Dokuz Eylül University School of Maritime Business and Management (Turkey)
- Turkish Maritime Education Foundation Institute of MaritimeStudies (Turkey)
- IFAPA Centre at Huelva (Spain)
- IPFP Marítimo - Pesquero de Canarias (Arrecife) (Spain)

Marina: meeting the language and skills needs of coastal and river tourism workers

Leading organisation:

- GODALEN VIDEREGAENDE SKOLE (Norway)

Members:

- Univerza na Primorskem - Faculty of Humanities (Slovenia)
- Stiftelsen Kursverksamhet Vid Lund Universitet/Folkuniversitetet (Sweden)

Other members:

- BEST Institut fuer berufsbezogene Weiterbildung und Personaltraining GmbH (Germany)
- Akses, spol. s r.o. (Czech Republic)
- Technologiko Ekapideftiko Idryma Epirou (Greece)
- Value Training & Solutions srl (Italy-Lazio)
- Lofts Designers Spain s.l (Spain)
- Anniesland Research Consultancy Limited (United Kingdom)

MARLISCO partnership

Leading organisation:

- Provincia di Teramo (Italy)

Members:

- Plymouth University (United Kingdom)
- University College Cork (Ireland)
- National University Of Ireland (Ireland)
- Faculdade de Ciências e Tecnologia - Universidade Nova de Lisboa (Portugal)

Other members:

- Coastal & Marine Union (EUCC) (Netherlands)
- The Secretary of State for Environment, Food and Rural Affairs (United Kingdom)
- European Plastics Converters (Belgium)
- European Plastics Recyclers (Belgium)
- MerTerre (France)
- Regionalni razvojni center Koper (Slovenia)
- Mare Nostrum (Romania)
- EUCC - The Coastal Union Germany (Germany)
- ISOTECH LTD (Cyprus)
- UBBSLA (Bulgaria)
- Turkish Marine Research Foundation (Turk Deniz Arastirmalari Vakfi) (Turkey)
- KIMO Danmark (Kommunernes Internationale Miljøorganisation) (Denmark)

Maritime Tests of English Language (MarTEL) (Marifuture)

Leading organisation:

- Centre for Factories of the Future (C4FF)

Members:

- Spinaker (Slovenia)
- Piri Reis University (Turkey)
- TUDEV Institute of Maritime Studies (Turkey)
- Satakunta University (Finland)
- Glasgow College of Nautical Sciences (United Kingdom)
- Tromsø University College (Norway)
- Maritime University of Szczecin (Poland)
- University of Strathclyde (United Kingdom)
- University of Cadiz (Spain)
- University of Aegean (Greece)
- 1st Evening VSS of Aegaleo (Greece)

MarTEL Plus (Marifurture)

Leading organisation:

- Centre for Factories of the Future (C4FF)

Members:

- Spinaker (Slovenia)
- Piri Reis University (Turkey)
- TUDEV Institute of Maritime Studies (Turkey)
- The 1st Evening Vocational Senior School of Egaleo (EPAL) (Greece)
- University of Cadiz (Spain)
- Satakunta University of Applied Sciences (Finland)
- Nicola Vaptsarov Naval Academy (Bulgaria)
- National Maritime College of Ireland (Ireland)
- World Maritime University (Sweden)
- WinNova West Coast Education (Finland)
- Irish Institute of Master Mariners (Ireland)
- 1st Evening VSS of Aegaleo (Greece)
- Glasgow College of Nautical Studies (United Kindom)
- University of the Aegean (Greece)
- ASAP English Courses

PAT (Professionalizing actors of transfrontier cooperation) - Adaptation of selected tools within the TEIN (Transfrontier Euro-Institut Network)

Leading organisation

- Euro-Institut (Germany)

Members:

- Centre for Cross Border Studies (CCBS) (United Kingdom)
- Carinthia University of Applied Sciences (Austria)
- Stowarzyszenie Rozwoju i Współpracy Regionalnej 'Olza' (Poland)
- Univerza v Ljubljani (Slovenia)
- FORSER - FORMAZIONE E SERVIZI PER LA PUBBLICA AMMINISTRAZIONE (Friuli) (Italy)
- Institut Catalan de Recherche en Sciences Sociales ICRESS (France)
- Institut EuroSchola (Czech Republic)

Perseus

Leading organisation:

- Hellenic Center for Marine Research

Members:

- Middle East Technical University (Turkey)
- University of the AEGEAN (Greece)
- National and Kapodistrian University of Athens (Greece)
- University of Crete (Greece)
- The Cyprus Research Center and Educational Foundation (Cyprus)
- University of Cyprus (Cyprus)
- Istanbul University (Turkey)
- University of Malta (Malta)

- University of Barcelona (Spain)
- Polytechnical University of Catalonia (Spain)
- Universite D'aix-Marseille (France)
- Universite Pierre et Marie Curie (France)
- Universite Paul Sabatier Toulouse III (France)
- University of Plymouth (United Kingdom)
- Universite de Liege (France)
- Universite of Haifa (Israel)

Seatalk (Marifuture)

Leading organisation:

- Centre for Factories of the Future (C4FF)

Members:

- Spinaker (Slovenia)
- Piri Reis University (Turkey)
- Mediterranean Maritime Research and Training Centre Coop. (MMRTC) (Malta)
- Nicola Vapstarov Naval Academy (NVNA) (Bulgaria)
- World Maritime University (WMU) (Sweden)
- University of Turku (UoT) (Finland)
- University of Antwerp (UoA) (Belgium)
- Antwerp Maritime Academy (AMA) (Belgium)

Other members:

- Centre For Development Works (OPR) (Poland)

SOS - Stress on Ships (Marifuture)

Leading organisation:

- Italian Shipping Academy Foundation (Italy)

Members:

- Piri Reis University (Turkey)
- International Maritime Safety, Security and Environment Academy (Italy)
- Technical Institute for Transports and Logistics San Giorgio (Italy)
- Italian Shipping Academy Foundation (Italy)
- Technical Institute for Transports and Logistics "Nautico San Giorgio" (Italy)
- Chalmers University of Technology (Sweden)
- Centre for Maritime Studies -University of Turku (Finland)
- Maritime University of Szczecin (Poland)
- Klaipeda University (Lithuania)

Other members:

- Istanbul's Nautical Secondary School (Turkey)

Ten Ecorport

Leading organisation:

- University of Bari (Italy)

Members:

- Institute of Marine Biology
- University of Montenegro (Montenegro)

Other members:

- Levante Port Authority (Italy)

THESEUS (Innovative technologies for safer European coasts in a changing climate)

Leading organisation:

- University of Bologna (Italy)

Members:

- Universidad de Cantabria (Spain)
- University of Plymouth (United Kingdom)
- Aalborg Universitet (Denmark)
- INFRAM International BV (The Netherlands)
- Helmholtz-Zentrum Geesthacht Centre for Materials and Coastal Research (Germany)
- University of Southampton (United Kingdom)
- Université de Versailles St-Quentin-en-Yvelines (France)
- Centre d'Etudes Techniques Maritimes Et Fluviale (France)
- Middlesex University Higher Education Corporation (United Kingdom)
- Instytut Meteorologii I Gospodarki Wodnej (Poland)
- Institute of Oceanology - Bulgarian Academy Of Sciences (Bulgaria)
- Athens University of Economics and Business – Research Center (Greece)
- Consorzio per la gestione del centro di coordinamento delle attivita di ricerca inerenti il sistema lagunare di venezia (Italy)
- Instytut Budownicta Wodnego Polskiej Akademii Nauk (Poland)
- BANGOR university (United Kingdom)
- Aristotelio Panepistimio Thessalonikis (Greece)
- Katholieke Universiteit Leuven (Belgium)
- Marine Hydrophysical Institute - Ukrainian National Academy Of Sciences (Ukraine)
- P.P. Shirshov Institute of Oceanology of Russian Academy of Sciences (Russia)
- University of Delaware (US)
- UNAM (Mexico)
- East China University (China)
- National Cheng Kung University (South Korea)

Trainmos (European Motorways of the Sea Knowledge programme)

Leading organisation:

- Polytechnical University of Madrid (Spain)

Members:

- Università degli Studi di Genova (Italy)
- National Technical University of Athens (Greece)
- Faculdade de Ciências Sociais Humanas (Portugal)
- Jacobs University Bremen (Germany)
- Edinburgh Napier University (United Kingdom)
- Chalmers Tekniska Hoegskola AB (Sweden)

TRECVET (Transnational Recognition of European Certification in Vocational Education and Training)

Leading organisation

- SEATECH Charter School

Members:

- Polytechnical University of Catalonia (Spain)

Other members

- Seebar (Germany)
- Danmar Computers (Denmark)

UNIMET - Unification of Marine Education and Training (Marifuture)

Leading organisation:

- Centre for Factories of the Future (C4FF)

Members:

- TUDEV Institute of Maritime Studies (TUDEV) (Turkey)
- Satakunta University of Applied Sciences (SUAS) (Finland)
- Osrodek Prac Rozwojowych / Centre of Development Works (OPR) (Poland)
- Maritime Institute Willem Barentsz (MIWB) (The Netherlands),
- Spinaker (SPIN) (Slovenia)
- Consorzio Armatori per la Ricerca - The Ship-owners Research Consortium (CONSAR) (Italy)
- Polytechnic University of Catalonia (FNB) (Spain),
- Lithuanian Maritime Academy (LMA) (Lithuania)

Wind Farm Support Vessels (EBDIG II) (Marifuture)

Leading organisation:

- Coventry School of Art and Design

Members

- Piri Reis University (Turkey)
- TUDEV Institute of Maritime Studies (Turkey)

Other members:

- Advisory Group (AG) made up of; RINA, BMF, Commercial and Lloyds Register

Annex 3: Survey - response characteristics

Table Annex 3-1 The number of persons that reached the end of the survey (n=172)

	Percentage	Count
Partially answered	31	54
Reached end	69	118
Total	100	172

Table Annex 3-2 Countries represented

	Percentage	Number
Albania	4	6
Algeria	4	6
Bosnia	1	1
Croatia	4	7
Cyprus	3	5
Egypt	5	8
France	8	13
Greece	12	20
Israel	1	2
Italy	22	36
Jordan	2	4
Lebanon	1	2
Malta	1	1
Montenegro	1	1
Morocco	4	6
Palestine	1	2
Slovenia	3	5
Spain	8	13
Turkey	5	9
Other, please specify	11	18
Total	100	165
Other countries		
Bulgaria		1
England		2
Germany		1
Gibraltar (UK)		1
Ireland		2
Latvia		2
Luxembourg		1
Monaco		1
Nigeria		1
Portugal		4
Serbia		1
USA		1

Annex 4: List of interviewees

SEA BASIN	COUNTRY	NAME	NAME OF INTERVIEWED PERSON + ROLE	SPECIFICITIES
Adriatic-Ionian	Albania	Chamber of Commerce and Industry of Tirana,	Ms Fabiola Duro, Director of Foreign Affairs	Key and active actor in Albania, representing the vast majority of Albanian provate stakeholders
Adriatic-Ionian	Slovenia	University of Ljubjiana	Ms Elen Twrdy, Dean	Faculty of maritime studies, active Member of MarED, it's therefore a key education provider in the Adriatic-Ionian
Adriatic-Ionian	Italy	Ministry of infrastructure and transports (National)	Ms Stefania Moltoni, human resources manager for the maritime sector	Key decision-maker when it comes to seafarers
Adriatic-Ionian	Italy	Assoporti (National)	Mr Paolo Ferrandino, Secretary General	Association representing and bringing together Italian ports
Adriatic-Ionian	Italy	University Iuav of Venice	Ms Elena Gissi, Scientific Coordinator	Coordinator of the Erasmus Mundus Master Course on Maritime Spatial Planning
Adriatic-Ionian	Italy	University of Bari	Laura Tafaro, Coordinator of the Bachelor Programme in management of maritime activities	Major university, specialised courses but no cooperation
West-Med	Algeria	Ministère de la Pêche et des Ressources Halieutiques	Mr. Mohamed Ghezali, Inspector	Key public stakeholder
West-Med	Algeria	ESMPE- High National College on Maritime Studies	MR. Abdelhamid HINI, Marine Engineering Department	Specialised National School on Maritime Studies
West-Med	France	SURTYMAR	Mr. Pierre MARIONNET, CEO	Specialised School on Maritime Security
West-Med	France	Interregional Directorate for the Mediterranean Sea	Mr. Paul Chadrin, Education Coordinator	Regional Government with specific focus in the Mediterranean area
West-Med	Spain	Centro Tecnológico del Mar - Fundación CETMAR	Mrs. Lucía Fraga, Education Coordinator	Public Authority focusing on maritime technologies
West-Med	Spain	Catalan Maritime Forum	Mr. Toni Tío	Very active cluster
East Med	Palestine	Ministry of Agriculture.	Mr Samer Titi, vocational education coordinator	One of the few stakeholders active in Palestine
East Med	Greece	IDEC S.A.- Training provider	Mr Aris Chronopoulos, Vice President	Private provider of training who responded to our survey
East Med	Greece	Business College of Athens	Head international department	Strong private provider of masters programmes in marine sector, with links to international programmes and certifications

SEA BASIN	COUNTRY	NAME	NAME OF INTERVIEWED PERSON + ROLE	SPECIFICITIES
East Med	Israel	Head of DEEP MED research group - School of Marine Sciences	Mr Dan Dtchernov - Head of DEEP MED group	Responded to survey, and suggested new networks in research that need to be developed
East-Med	Lebanon	Department of Fisheries & wildlife	Mr Samir Majdalani, Head of Department of Fisheries & Wildlife	Identified as potential key informant on existing training and education providers
East Med	Greece	Piraeus Port Authority SA	Mr Thanassis Karlis, strategic planning manager	Responded to survey, important marine cluster
East Med	Egypt	Damietta port Authority	Mr Reda Abdou Alshaweesh, General Manager	Identified as informant for overlooking both private sector and education provision
East Med	Greece	Cosmos Nautical Training Centre	Capt. Panagis Tzortzatos, Managing Director	Responded to survey

Annex 5: Lists of participants to focus groups

Institution/organisation	Country	Participant	Focus group
AL-Manar University of Tripoli	Lebanon	Walid Kamali	Larnaca
Andreas Syggros Hospital	Greece	Kyriakos Xenos	Athens
Arab Academy for Science, Technology and Maritime Transport	Egypt	Ahmed M. Youssef Taha	Larnaca
Aristotle University of Thessaloniki, School of Biology, Faculty of Sciences	Greece	Theodore Abatzopoulos	Athens
Cartil Ltd	Malta	Awad. A. Mahmoud	La Valletta
Chamber of Commerce (Shipping & Bunkering)	Malta	Bernard Sultana	La Valletta
Chartered Institute of Logistics & Transport	Malta	Miriam Camilleri	La Valletta
CMA/CGM - Motherwell Bridge	Malta	Martin Husband	La Valletta
CNR - Institute of Biomolecular Chemistry, Napoli.	Italy	Angelo Fontana	Athens
Cyprus Maritime Academy	Cyprus	Stylianos Mavromoustakos	Larnaca
Cyprus Naval Architects & Marine Engineers Association	Cyprus	Christis Angelides	Larnaca
Cyprus Shipping Chamber	Cyprus	Alexandros Josephides	Larnaca
Department of Merchant Shipping, Seafarers' Division	Cyprus	Kyriacos A. Kyriacou	Larnaca
Directorate-General for Maritime Affairs and Fisheries (DG MARE)	European Commission	Christos Theophilou	Larnaca & Athens
ECORYS	Belgium	Diletta Zonta	Genoa
ECORYS	Belgium	William Mejia	Genoa
ECORYS	Belgium	Jan Maarten de Vet	Larnaca
ECORYS	Netherlands	Jeroen Kleingeld	Athens
Gozo Channel Co. Ltd	Malta	Sammy Grech	La Valletta
Holy Spirit University of Kaslik	Lebanon	Jihane Abi Khalil	Genoa
Istanbul Technical University	Turkey	Ozcan Arslan	Larnaca
Italian Coastguard	Italy	Gianluca Donadio	Genoa
Italian Coastguard	Italy	Paolo Meneghetti	Genoa
Italian Merchant Navy	Italy	Paolo Magrone	Genoa
Jordan Academy For Maritime Studies	Jordan	Hesham Al Hamran	Larnaca
Malta College of Arts, Science and Technology	Malta	Therese Camilleri	La Valletta
Malta College of Arts, Science and Technology	Malta	Vince Maione	La Valletta
Malta Maritime Forum	Malta	Charles Schembri	La Valletta
Malta Maritime Forum - Combined Maritime Services Ltd	Malta	Silvan Fleri	La Valletta
Malta Motorways of the Sea (Grimaldi)	Malta	Joseph Bugeja	La Valletta
Marine Science Station(MSS) Aqaba-Jordan University	Jordan	Mohammad Wahsha	Athens
Maritime Institute of Eastern Mediterranean	Cyprus	Zacharias Siokouros	Larnaca
Mediterranean Institute of Maritime Training	Tunisia	Imed Zammit	Genoa

Institution/organisation	Country	Participant	Focus group
Medsea Shipping Agency	Malta	Michael Callus	La Valletta
Ministry For Transport and Infrastructure	Malta	Stephen Bonello	La Valletta
Ministry For Transport and Infrastructure	Malta	Janice Borg	La Valletta
Ministry of Education and Culture	Cyprus	Panikos Giogroudes	Larnaca
Motherwell Bridge Industries Ltd	Malta	John M Borg	La Valletta
MRAG Ltd, UK	United-Kingdom	Ian Payne	Athens
National & Kapodistrian University of Athens, School of Pharmacy	Greece	Vassilios Roussis	Athens
National & Kapodistrian University of Athens, School of Pharmacy	Greece	Efstathia Ioannou	Athens
National & Kapodistrian University of Athens, School of Pharmacy	Greece	Stephanos Kikionis	Athens
National & Kapodistrian University of Athens, School of Pharmacy	Greece	Lito Tziveleka	Athens
National Technical University of Athens, Greece	Greece	Dimitrios V. Lyridis	Larnaca
NAYS Ltd	Greece	Ioanna Argyrou	Athens
NAYS Ltd	Greece	George Triantaphyllidis	Athens
NAYS Ltd	Greece	Elina Theologou	Athens
NAYS Ltd	Greece	Katerina Iordanidou	Athens
NAYS Ltd, Greece	Greece	George V. Triantaphyllidis	Larnaca
Oceanography Centre, University of Cyprus	Cyprus	Dan Hayes	Larnaca
Oil Tanking Malta Ltd	Malta	Alex Fenech	La Valletta
Safesea Marine Centre	Malta	Matthew Bajada	La Valletta
Suez Canal University Hospital, Suez Canal University	Egypt	Diaa T. A. Youssef	Athens
The Agricultural Research Institute	Cyprus	Polycarpos Polycarpou	Athens
Transport Malta	Malta	Axisa, Jeanette	La Valletta
Transport Malta	Malta	Roberta Cilia	La Valletta
Tunisian Naval Academy	Tunisia	Hatem Soussi	Genoa
University Abdelmalek Essaâdi of Tangier	Morocco	Jamal Eddine El Abdellaoui	Genoa
University of Cyprus	Cyprus	Andreas Alexandrou	Larnaca
University of Cyprus -Oceanography Center	Cyprus	Niki Chartosia	Athens
University of Genoa	Italy	Carlo Podenzana	Genoa
University of Genoa	Italy	Lorenzo Schiano di Pepe	Genoa
University of Malta	Malta	Aldo Drago	La Valletta
University of Malta	Malta	Anthony Bartolo	La Valletta
University of Malta	Malta	Claire De Marco	La Valletta
University of Piraeus - Department of Economics / E-Learning Executive Programs	Greece	Isidoros Pachoundakis	Larnaca
University of Udine, Department of Food Science	Italy	Marco Galeotti	Athens
University of Zagreb, Faculty of Pharmacy and Biochemistry	Croatia	Marijana Zovko	Athens
WorldFish Centre, Regional Centre for Africa & W/Asia,	Egypt	Malcolm Dickson	Athens

Institution/organisation	Country	Participant	Focus group
Yachting Malta	Malta	Wilfred Buttigieg	La Valletta

Annex 6: Description of participants to focus groups

4.3 Barcelona Focus Group

Education

Higher education

- **Tecnocampus Mataró**: it is a science and innovation park based in Mataró (near Barcelona). Inside the science park there are three university centers (Polytechnic School, School of Social Sciences and Business and School of Health Sciences) attached to the Pompeu Fabra University. It has developed a Degree in Logistics and Maritime Business which responds to the demands of the logistics, transport and maritime business sectors, and it includes subjects related to international trade, port management, customs operations, maritime law and related legislation, logistics and supply chain management, and maritime company management, among others, with an international vision focused on professionalism. Many companies, port authorities and marinas directly support this degree;
- **Polytechnic University of Catalonia – Barcelona nautical faculty:** it is the only center offering training in the areas of marine engineering and marine civil (nautical and maritime transport, marine technologies) in Catalonia. We have as main objective to train highly qualified professionals in these areas by offering them a solid technology and science so that they are able to adapt to the constant changes and requirements of the professional world and society. It offers the following courses:
  - Degree in Naval Systems and Technology;
  - Degree in Nautical Studies and Maritime Transport Ship Statements in Internship / Business Maritime and Port Logistics;
  - Degree in Marine Technology in Practice Statements Boat / Marine Electrical;
  - Master's degree in Marine Engineering
  - Master's degree in Nautical Engineering and Maritime Transport;

  It is important to highlight their active role in the participation of networks and projects. They are members of two important networks (IAMU (International Association of Maritime Universities) and European Platform for Maritime Education, Research, and Innovation – MariFuture).

VET education

- **Fishing and nautical school of Catalonia (*Escola de capacitació náutico pesquera de Catalunya):*** it is a public school which provides VET programmes in the nautical, fisheries and diving sector. It also manages the education and qualifications of the boating and recreational diving. It offers the following courses:
  - Diving;
  - Maintenance and control of the machinery of ships and boats;
  - Navigation and coastal fishing;
  - maintenance of recreational boats (adaptation CFGM Electromechanical Maintenance);
  - Shipping and offshore fishing;
  - Organisation of machinery maintenance of ships and boats.

  The school attached great importance to cooperation, both with local and international actors. They have established permanent channels of cooperation with the Barcelona nautical faculty and are also very active in the Erasmus initiative;

- **Nautical institut of Barcelona *(Institut nàutic de Barcelona):*** It is a new (established in 2015) integrated professional training institute specializing exclusively in the field of sports and maritime recreational studies. It offers initial professional training in maintenance of boats and recreational sports (dual mode) and sports education (lifeguard, sailing and diving). It is a public organisation created through an agreement between the Education Consortium of Barcelona, the Department of Education of the regional government and the Far Consortium. It was created from the merge of all the nautical institutes and schools of the city with the aim to train and qualify professionals of the sea, with technical skills and attitudes required for the field of sports and recreation. Its location in the Port of Barcelona facilities contributes to reinforce the establishment of links with businesses and organisations nautical sector, promote a close relationship with the professional sports world and to have a key role in the revitalization and competitiveness of the Port of Barcelona.

Business, Industry and Trade

- **Barcelona Cluster Nautic:** is established in October of 2013 with the goal of transforming water sports activity into an economic driving force for the city, its metropolitan area and for the country, taking full advantage of the existence of a sector which brings together industry, companies, entities and research centres, a mix that has enormous potential to generate wealth and added value. **It** currently has almost fifty members, including the Town Hall and the Port of Barcelona, Barcelona Regional, Marina Barcelona 92, Marina Port Vell, la Universitat Politècnica de Catalunya (UPC), Consorci El Far and Fundació Navegació Oceànica Barcelona (FNOB), all active partners. Barcelona Clúster Náutic is born out of the conviction that the nautical sector can become a major player in the economic growth of the country and in creating wealth and jobs. The mixed structure of this Cluster, made up of private and public agencies, allows the public administration to have different public policies participate in the entity, favouring its cross-disciplinary profile in benefit to the city as a whole, as well as to the possible integration of regional policies. Furthermore, the existence of an important corporate fabric within the Cluster provides operational facilities, broader and deeper knowledge of the sector and its job market, as well as more possibilities for interaction and transfer of know-how between different players. Barcelona Clúster Nàutic wants to take on a unifying role that articulates dialogue between authority, industry and community;
- **Chamber of Commerce of Barcelona:** the main function is to defend the general interests of the companies and provide the necessary actions the promotion of trade and industry. It plays an important role also in the field of training;
- **Marina Barcelona 92:** founded in 1992, MB92 is an expert management company in the maintenance refit and repair of super yachts. It counts with facilities of 76.000 m2. It is committed to continue on-the-job training for their employees in areas of naval engineering, risk prevention, languages and design programmes. It is very active in cooperating with other local actors at local and regional level in order to find solutions to match the gap between the offer and demand of maritime training and education programmes and professionals;
- **Barcelona Crew:** with more than 15 years of experience, it is a market leader in the Recruitment and Training in the field of Maritime and tourism industry specifically oriented towards luxury yachts and cruises. It is the first agency in Barcelona dedicated to providing customized services in the Recruitment and Training of qualified personnel for the Luxury Yacht industry. In terms of training, it provides customized Training services for the Luxury Yacht industry to fill staff's gaps in knowledge and skills to take on-board service levels to 5* Star. Training is delivered on on-board or at our land-based facilities. Barcelona Crew in collaboration with certified Marine Schools and Professionals offer the possibility to obtain the Maritime training Certificates, mandatory to work on board of different kind of ships, yachts.

Institutions

- **Barcelona Activa:** Barcelona Activa is integrated in the Area of Employment, Enterprise and Tourism at Barcelona City Council; it is responsible for promoting the economic development of the city, designing and implementing employment policies for citizens, and encouraging the development of a diversified local economy. For the last 28 years it has been a driving force behind Barcelona and its hinterland's economic activity, supporting policies to develop employment, entrepreneurship and business, while promoting the city and its strategic sectors internationally, but from a regional perspective;
- **BCN Vocational Training Foundation *(Fundació BCN Formació Professional):*** The BCN Vocational Training Foundation is a non-profit organisation of private nature promoted by the Barcelona City Council. The mission of the Foundation is participating in the economic development of the city, from the promotion of the relationship between vocational training and productive environment City Metropolitan Area, promoting vocational training and adequate support the needs of the productive system and facilitating the transition to the world of work and the full integration of students through the implementation and project management and implementation of specific actions aimed at companies and training centers. It becomes an instrument to develop a shared project between the productive sector and training of the city; and finds its framework of understanding and coordination between the training centers from students and teachers, the administration and the business community. It is very active in cooperating both at local and international level;
- **Education Consortium of Barcelona *(Consorci d'educació de Barcelona – CEB):*** It is a management tool and decentralization within a framework of institutional cooperation, which represents the will of the Government of Catalonia and Barcelona City Council to work together to improve services to schools and the public through a single educational network. Created by law in 1988, among their main objectives are:
  - Planning (programming and territorial distribution of schools included in educational planning laws in force, except for college, according to the provisions of article 61 of Law 22/1998 of 30 December)
  - Educational services and educational innovation programs (creation, within the overall planning and management of resources and educational centers, support services, counseling and educational psychology research and training of staff);
- **Barcelona Port:** the port of Barcelona is one of the most important ports in the mediteranean region. It ended 2015 with positive results in its key traffic indicators, with record figures in foreign trade and certain strategic cargo segments such as vehicles and motorways of the sea. It is also very important in terms of cruise industry being the first European port in numbers of cruise passangers.

International Organisations

- **Union for Mediterranean:** it is an intergovernmental institution bringing together 43 countries (28 European Union Member States and 15 countries from the Southern and Eastern shores of the Mediterranean) to promote dialogue and cooperation in the Euro-Mediterranean region. Education and training is a priority area for the institution. In this field, the UfM works in collaboration with relevant stakeholders on the identification, labelling and promotion of specific pilot projects and initiatives which contribute to the establishment of a Euro-Mediterranean Higher Education and Research Area. Reinforcing and developing the Euro-Mediterranean Higher Education and Research Area will contribute to building cultural bridges between both rims of the Mediterranean, and mutual understanding among people;
- **CRPM – Intermediterranean Commission:** The Conference of Peripheral Maritime Regions of Europe (CPMR) brings together some 150 Regions from 28 States from the European Union and beyond. Representing almost 200 million people, the CPMR campaigns in favour of a more balanced development of the European territory. The CPMR is sub-divided into six

Geographical Commissions, corresponding to the European maritime basins, such as the Atlantic Arc, the Baltic Sea, the North sea, the Mediterranean, the Balkan and Black sea and the islands. The he Intermediterranean Commission, set up in 1989, focuses on the south of the Mediterranean and the development of the Euro-Mediterranean dialogue. Their main objectives are to Encourage the emergence of a macro-regional strategy in the Mediterranean, Develop a "Mediterranean of projects: Mobilise partners from the south of the Mediterranean;

- The Intermediterranean Commission is the lead partner of the **Vasco da Gama** project to contribute to achieving the development of high professional skills and the development of education and training conditions within the EU to ensure efficient, safe, secure and environmentally shipping operations and the overall efficiency of the transport chain**.**

4.4 Malta Focus Group

Transport Malta is the Government Authority that aims to achieve the following objectives:

- develop integrated transport policies aimed at achieving modal shifts that favour public transport and non-polluting strategies;
- ensure the development of an efficient and socially sustainable public transport system in Malta;
- promote the maritime and civil aviation facilities of Malta and the registration of ships and aircraft under the Maltese flag;
- promote policies that favour the development of Malta as a maritime hub in the Mediterranean and as an entre-port to the European Union;
- ensure that the administration, services and operations of ports and yachting centre's in Malta are more efficient and cost-effective;
- standardize practices in the transport sector in Malta in line with international norms and with those of the European Union in particular.

The following representatives were present at the focus group; Jeanette Axisa en Roberta Cilia.

The website of Transport Malta shows the wide variety of services that are offered to all modes of transport (http://www.transport.gov.mt/). In a press release dates 6th of May the relationship with education is highlighted, on the occasion of a visit of 8 students:

> This week, Maritime Malta, through Transport Malta is hosting a group of students from the World Maritime University in Malmo, Sweden for a field trip to Malta. The 8 students, hailing from countries in Africa and Asia, occupy senior environmental and ocean management related posts in their respective Administrations and are reading for a Master's degree in Marine Environmental and Ocean Management.
>
> In a brief comment on the occasion, Transport and Infrastructure Minister Joe Mizzi, reiterated Malta's commitment to share its facilities and considerable experience in maritime matters with the rest of the maritime community and the Malta's firm commitment towards technical cooperation.
> During the course of the visits, the students will be addressed by the maritime community with a view to acquiring useful elements of local maritime operations that complement the theoretical aspect of their studies.
>
> Set up in 1983 by the International Maritime Organisation (IMO), the WMU is the foremost institution for high-level maritime education and research. WMU offers specialized postgraduate education in maritime affairs, leading to the award of PhD, MSc, Postgraduate Diploma or Postgraduate Certificate. Over the years eight Maltese graduates, five of whom are still in the employ of the Authority for Transport in Malta, have successfully completed WMU post graduate courses on a regular basis.

Transport Malta through its Merchant Shipping Directorate hosts these field trips as part of a technical assistance scheme within the framework of an enhanced role for Malta as a result of its increasing relevance within the maritime industry.

The fact that the field trip has been incorporated as a regular feature in the curriculum of the University's courses is testament to the instructional value of the Malta visit towards the students' academic and professional development.

The **Malta Maritime Forum** was officially launched in July 2015. It has long been felt that at a local level there was a dire need for the setting up of a common platform to co-ordinate the efforts, aspirations and challenges faced by the various sectors that go to make up the Malta maritime industry. This is what the Malta Maritime Forum aims to achieve. Its main objectives are to promote and defend the interests of the various maritime sectors and to assist in the development of new maritime activities. Emphasis is being laid on bridging between the industry and the academic to ensure that the local maritime industry develops solid foundations for correct path development.

The maritime industry in Malta is of such vital importance that it cannot afford to lag behind when it comes to standards and professionalism. The marketing of the Malta flag, the development of the Malta Freeport Terminal, the success registered by Valletta Cruise Port - to mention a number of success stories, cannot be left to chance, and the industry has to ensure standard and quality to ensure sustainability.

The aim of the Malta Maritime Forum is to act as a constituted body so as to consult and be consulted by Government in the development of public policies that can have a bearing on the Malta maritime industry.

The minister was also briefed on the pro-active approach that the existing twenty four members are taking and pledged that from his side, the Forum will be welcome. He noted that although a lot of progress has been registered, there still remains inefficiencies and unnecessary bureaucracy that have to be tackled and eliminated. He agreed that through the support that Transport Malta has given to this initiative, the Forum will make a counter balance for the same authority so that progress is achieved through constant consultation.

This forum is industry-driven, although this initiative has found support and encouragement both from the government as well as public authorities involved in the maritime sector. The need for a maritime forum has been felt by the industry for a long time because, whereas certain maritime sectors are well represented by their respective associations, there has always been a lack of a holistic approach which views maritime issues from a broader perspective. The forum will aim at harnessing the capabilities, potential and successes registered by various sectors of the maritime industry and to emulate such success throughout the whole industry.

This can only be done by careful analysis, identification of strengths, establishment and enforcement of standards and a general effort to upgrade the maritime product. This initiative will embrace Malta's strategic geographical position, as well as its vision of being a maritime hub of excellence. Michael Callus, Josef Callega, Ann Fenesh, Joseph Bugeja and the chairman of the Malta Maritime Forum Joe Borg were all present at the focus group.

Ministry for Transport and Infrastructure (MTI)

The MTI of Malta is responsible for a wide range of tasks within Malta. They coordinate Mayor government projects among which are road building, maintenance and landscaping. Next to that the NTI have in their portfolio:

- Manufacturing and Servicing;
- Construction and Maintenance;
- Cleansing;
- Internal and Maritime Transport;
- Ports;
- Roads;
- Oil Exploration.

The MTI was represented by Stephen Bonello and Janice Borg.

University of Malta

The University of Malta is the highest teaching institution in Malta. It is publicly funded and is open to all those who have the requisite qualifications. Full time course are completely free of charge. The University's structures are in line with the Bologna Process and the European Higher Education Area.

There are some 11,500 students including over 600 international students from 71 different countries, following full-time or part-time degree and diploma courses. The University regularly hosts a large number of Erasmus and other exchange students.
Conscious of its public role, the University strives to create courses which are relevant and timely in response to the needs of the country. For the University of Malta were present Aldo Drago, Anthon Bartolo and Claire de Marco.

Malta Chartered Institute of Logistics & Transport (MCILT)

The Chartered Institute of Logistics and Transport is a worldwide organisation with an established International pedigree. With over 30,000 members in 30 countries, the CILT spans the globe. The objectives of the Chartered Institute of Logistics & Transport (CILT) are to:

"promote, encourage and co-ordinate the study and advancement of the science and aft of transport and logistics in all its forms"

To this end they provide knowledge on a worldwide basis to people entering, working and connected with the logistics and transport professions. Our members work in a number of professional areas including;

- Freight transport;
- Passenger transport;
- International trade;
- Infrastructure and planning.

CILT also seeks to;

- Supply excellent people throughout their career to our professions;
- Share best practices with fellow professionals;
- Support lifelong learning with Continuing Professional Development;
- Work with accredited educators and trainers to provide learning and practical;
- Research;
- Promote holistic logistics and transport policy to shape our communities and
- Economies.

Of the Malta department of the CILT Miriam Camilleri was present at the work shop.

The Malta Chamber of Commerce, Enterprise and Industry (Shipping & Bunkering)

The shipping and bunking business section of the Malta Chamber of Commerce, Enterprise and Industry, is very important in bringing together business and government. In the past they have worked together closely with the Association of Shipping Agents (ASA). Topics as the supply of fresh water, the increase of freight costs and bunker tax are a few of the many fields in which they are active.

Malta Chamber of Commerce, Enterprise and Industry was represented by Bernard Sultana.

Trade and industry was represented by a wide range of companies amongst were:

- The **Safe sea Marine Centre** (Specializes in boating needs and carries a wide range of boat accessories);
- **Motherwell Bridge** (Specializes in mechanical and electrical engineering; on-site construction and maintenance of port-handling equipment; non-destructive testing inspections; industrial and marine engine overhaul; technical training and tooling);
- **CMA CGM Malta Agency** (The Malta agency of the worldwide shipping group present in more than 160 countries through its network of over 655 agencies, with more than 22,000 employees worldwide);
- **Oil Tanking Malta Ltd** (Part of Oiltanking, an international storage company for oils, chemicals, gases and dry bulk. Active in 22 countries operating 73 terminals);
- Gozo Channel Co. Ltd (Gozo Channel was formed in 1979, to maintain, develop, and operate a sea transport service to and from Malta, Gozo and elsewhere);
- **Malta Motorways of the Sea** (A freight and passenger shipping company owned by the Grimaldi group);
- **Yachting Malta** (a joint venture between the Government of Malta and the Royal Malta Yacht Club through Projects Malta Ltd. YM aims to identify and attract to Malta new high profile yachting events including regattas, class sailing, power racing events, boat shows, conferences and other activities related to yachting).

4.5 Larnaca Focus Group

Maritime Institute of Eastern Mediterranean (Mar.In.E.M.)

The “Maritime Institute of Eastern Mediterranean” is a non-profit Organisation, based in Cyprus. Mar.In.E.M. as it is now widely known was established in 2010 with the aim of promoting Maritime Research, Technology and Innovation, as well as Education and Training in the Blue sectors of the economy. At the same time – acting as a Policy Research Centre – it encourages and facilitates the Dialogue, Networking and Cooperation among the sector’s stakeholders including regional and international research, academic and governmental institutions, private organisations, NGOs and individuals. In this context It undertakes various initiatives that strengthen and enhance the cooperation at a regional level, in line with the European Union’s aspirations for an Integrated Maritime Policy and the 2012 “Limassol Declaration” for the promotion of Blue Growth.

Outmost vision of Mar.In.E.M. is the establishment of a “Maritime Cluster in the Eastern Mediterranean” - as an essential aspect of a “European Maritime Strategy for the Eastern Mediterranean” – based on the model of the EU Strategy for the Adriatic and Ionian region - encompassing the whole range of sea-related economic activities, which would foster synergies between the various regional stakeholders who are currently scattered and in some cases, isolated within National boundaries.

The Institute is now actively involved in various sectors of Maritime and Marine Affairs, including:

- **Marine and Maritime Technology and Innovation** – participating in EU funded Research Projects. Participation in the “Lynceus Project” which was funded by the European Union’s

Seventh Framework Programme and it referred to the development of innovative technology on board passenger ships, which enabled the timely and efficient locality of passengers during emergencies. The “Lynceus project” was presented in May 2014 during the meeting of the IMO’s Maritime Safety Committee and, was featured in the programme “Futuris” of EuroNews. Lynceus Project won the Global Lloyd’s List Awards 2014 in the field of Innovation. Very recently, the European Commission under the HORIZON2020 programme has approved a new project called “Lynceus2Market”. The project’s aim is to demonstrate the Lynceus technologies through large-scale demonstrations on passenger ships. (http://www.lynceus-project.eu/). Another EU funded Research project was the “MEDNET” project (2012 -2015) which aimed in the simplification and standardization of customs procedures in EU Ports (http://www.mednetproject.eu/). The Senior Researcher of the Institute, Mr. Ionas Koulendros was appointed as a member of the Sub-Group on Research and Innovation by the European Sustainable Shipping Forum (ESSF) established by the DG Mobility and Transport of the European Commission. In addition, Mar.In.E.M. also participated in CoRINThos Project. The CoRINThos Project was a one year project (2014 – 2015) funded by the MED Programme. CoRINThos project tackled the R&D gaps as a driving factor of maritime clusters, identifying and contextualizing them within Blue Economy sectors and geographical eco systemic synergies, at national and transnational level (http://www.medmaritimeprojects.eu/section/corinthos);

- **Maritime Labour** – investigating labour constraints currently faced in the maritime sector as well as, ways to attract young people into maritime professions. Mar.In.E.M. organised the events “Blue Career 2013, 2014 & 2015”, which had as a main goal to inform society and especially young people, about the employment opportunities in the Marine and Maritime Industry. Additionally in order to enhance the promotion of maritime professions, members of the Institute often deliver presentations in schools in Cyprus;
- **Maritime Education and Training** – supporting the development of Schools and Academies in Maritime Studies, in cooperation with governmental and private educational institutes. The Maritime Institute of Eastern Mediterranean in cooperation with the University of Nicosia, the Arab Academy for Science Technology & Maritime Transport, , and Intercollege Larnaca established the Cyprus Maritime Academy, the first of its kind in Cyprus. The Academy’s aim is to develop and offer Academic and Technical Programmes relating to the Maritime Industry. The academic subjects awarded will be at the level of a Master’s Degree, and a Bachelor’s Degree, while some academic subjects will lead to the acquisition of Certificates of Competency. The Cyprus Maritime Academy will also offer Certificates in specialized Maritime Training Programmes;
- **Maritime and Coastal Tourism** – with the submission of proposals for the promotion of cruising in the Eastern Mediterranean area, through the cooperation of all the regional countries – “The Cruise East Med Forum” – but also of diving tourism through the development of Artificial Reefs and other relevant infrastructure. The Institute is participating in the Cyprus National Thematic Group for the Development and Promotion of Cruise Tourism;
- **Maritime Transport** – In this context, the Institute manages the “Cyprus Short Sea Promotion Centre”, a non-profit EU organisation, which has as a main objective, amongst many, the promotion, collection and dissemination of information, education and research in issues related to Short Sea Shipping;
- **Maritime Security & Surveillance** - with interventions in “Search and Rescue” issues, but also with the development of maritime search and rescue technologies;
- **Marine Environment and Sustainability** – Participating, in cooperation with Academic Institutions, in air emissions reduction programs for ships, sea water environmental monitoring, etc. Member of the Monitoring Committee of the Operational Programme «Thalassa» 2014-2020, financed by the European Maritime and Fisheries Fund (EMFF). The President of the

Institute, Mr. Zacharias Siokouros was appointed as a member of the Council of Oceanography Center, University of Cyprus;

- Marine Heritage – with involvement in projects such as the excavation of the Ancient wreck at Mazotos coast, the maintenance of the traditional boat "Lampousa" for Lemessos Municipality and the promotion of the establishment of a "Maritime Heritage Centre of the East Med".

The Cypriot Department of Merchant Shipping (DMS)

The Cypriot Department of Merchant Shipping (DMS) was established and started functioning as a distinct entity in the Ministry of Transport, Communications and Works, in 1977. The service existed, however since 1963 and functioned under the Department of Ports. The Department's activities include: registration of ships, administration and enforcement of the merchant shipping legislation, control of ships and enforcement of international conventions, investigation of marine casualties, resolving labour disputes on board Cyprus ships, and training and certification of seafarers. The Cyprus Registry has shown phenomenal growth in the last twenty years. In the early eighties Cyprus ranked thirty-second on the list of leading maritime nations. It now ranks among the top ten with a merchant fleet exceeding 20 million gross tons. The mission of the DMS is the further growth of Cyprus in the Merchant Shipping sector, its establishment as an international maritime centre and the promotion of Cyprus Flag as flag of quality in the international scene.

The DMS employs marine surveyors, lawyers, economists and IT specialists. Present staff comprises of 34 Marine Surveyors, 16 Maritime Affairs Officers and 10 Maritime Affairs Assistants whereas 14 new post for Marine Surveyor are in the process of being filled. The DMS Maritime Training and Certification Division, responsible for the implementation of the STCW Convention, obtained already the ISO certification in February 2004.

Maritime offices are established in Piraeus, Hamburg, Rotterdam, London, New York and Brussels in order to extend the services provided by the Department of Merchant Shipping and to strengthen the presence of Cyprus abroad. A global network of inspectors of Cyprus ships is established by the Government of the Republic of Cyprus. The aim of the programme is the verification and enforcement of compliance of Cyprus ships with the applicable provisions of the national and international maritime legislation relating to safety, pollution prevention, the qualifications of the seafarers and the living and working conditions on board Cyprus ships. Sixteen inspectors have so far been appointed in thirteen ports worldwide. These Flag State inspections are carried out at no cost to the ship owners.

Functions

The DMS is functioning under the Ministry of Communications and Works and is accountable to the Ministry for the effective implementation of the merchant shipping laws and the international maritime conventions to which Cyprus is a contracting party. In particular, the basic functions of the Department are the following:

- Registration of ships and small vessels and registry related transactions;
- Control of Cyprus flag vessels in respect of safety, security, pollution prevention, qualifications of seafarers and living and working conditions of seafarers;
- Inspection / surveys of foreign flag vessels in Cyprus ports (Port State Control) as a contracting party to the Paris Memorandum of Understanding on Port State Control;
- Control and certification of coastal passenger and high-speed craft;
- Training, Certification and Registration of Seafarers;
- Continuous updating of the merchant shipping legislation and harmonisation with the European Union legislation;
- Taxation of ship owning and ship management companies;
- Promotion and further development of Cyprus as a maritime centre and an international registry;

- International relations, participation in international organisations, bilateral agreements and cooperation with maritime authorities of other countries;
- Implementation of the STCW 78 Convention as amended;
- Registration of Seafarers; Issue of Seafarers' Identification and Sea Service Record Books; Issue of seafarers certificates;
- Implementation of MLC 2006 Convention;
- Examination and approval of equivalent arrangements, temporary permits and exemptions from statutory provisions.

Long-term objectives

Apart from the fulfilment of obligations arising from the merchant shipping legislation, the following long-term objectives are pursued by the Department:

- The qualitative upgrade of the technical, administrative, legal and financial infrastructure of Cyprus in the maritime sector, in cooperation with other Government departments and private organisations;
- Pollution prevention from ships and the protection of the marine environment;
- The further improvement of the quality of both the ships registered in Cyprus and the crew employed on them;
- Improvement of safety standards and conditions of living and work of seamen on board Cyprus ships in accordance with international conventions currently in force;
- Further upgrading of Cyprus's maritime role at the European and International level;
- The establishment of economic and other incentives aiming to attract more Cypriots to the merchant shipping professions;
- The establishment of maritime training facilities in Cyprus, for both officers and ratings;
- Further development of Cyprus in the area of merchant shipping, promotion of Cyprus as a base for international shipping activities and enhancement of the international reputation of the Cyprus flag as a maritime flag;
- Exploring new incentives which aim at improving the competitiveness of the Cyprus flag and the attractiveness of Cyprus as a maritime centre.

Oceanography Centre, University of Cyprus (UCY)

The University of Cyprus (UCY) was established in 1989 and admitted its first students in 1992. It was founded in response to the growing intellectual needs of the Cypriot people, and is well placed to fulfil the numerous aspirations of the country. There are now 8 faculties, 22 departments and 11 research units at UCY.

The Oceanography Center (OC), the first research unit of the Faculty of Pure and Applied Sciences, which was founded in October of 2010 with an ambitious goal: the development of marine research focusing on the Eastern Mediterranean. The research activities of the Oceanography Center principally cover the following areas:

1. Physical Oceanography
   - Arithmetic modeling: circulation, sea state, dispersion.
   - Remote sensing: in-situ and satellite.
   - Observation: coastal research cruises, open sea research cruises, autonomous underwater vehicles.
2. Operational Oceanography
3. Biological Oceanography
4. Oceanographic databases

The OC aims to promote research and function as the starting point of new research projects and ideas relating to marine sciences. The OC is open to research collaborations with young or experienced researchers and with any organisation involved with marine sciences and with the marine environment. The mission of the OC is to conduct basic and applied research in the fields of ocean physics and dynamics, remote sensing, operational oceanography, biological and chemical oceanography, environmental assessments, dedicated ocean and marine data and meta databases and information systems, etc. The OC aims to contribute through research in the increase of the scientific knowledge of the EEZ of Cyprus in the Levantine Basin and the Mediterranean. In addition it aims to improve and develop various components of operational monitoring and forecasting of the marine system at local, sub-regional and regional scales.

Moreover, the Center aims to operate the Cyprus coastal ocean forecasting and observing system (CYCOFOS) in cooperation with existing operational ocean forecasting networks in Europe and the Mediterranean (MONGOOS, MyOCEAN) within the scopes of EuroGOOS and GMES-Copernicus as well as to demonstrate and provide information regarding the marine environment to decision makers, key end users and to the public. Furthermore, the Center is keen to offer consulting services to government and private sectors (e.g. search and rescue, oil spill pollution, pelagic fisheries, fish farming, desalination plants, disposal of industrial effluent, oil and gas industry).

Cyprus Shipping Chamber (CSC)

The Cyprus Shipping Chamber (CSC) is the trade association of the Shipping Industry in Cyprus. Having witnessed considerable growth since its establishment in January 1989, with originally seventeen Founding Members, the Chamber today comprises all the major ship owning, ship management, chartering and shipping related companies based in Cyprus. Today, the Chamber's Member-companies located in Cyprus and the wider Shipping Sector in Cyprus, collectively employ around 4500 persons ashore and more than 55,000 seafarers of various nationalities onboard their vessels.

The main purpose of the Chamber is "...promoting the interests of Cyprus Shipping and furthering the reputation of the Cyprus flag, whilst promoting and protecting the interests of its Members both nationally and internationally...". As such, the Chamber acts as a lobbying group for the promotion and safeguarding of the legitimate interests of its professional Member-companies, at a national level through its close relations with the Cyprus Government and Parliament, as well as at an international level though its membership at the various regional and international ship-owners associations.

Since its formation, the Chamber has become a very influential body and no policy decisions concerning shipping matters are taken by the Government without consulting the Chamber. This has been achieved through the participation of the Chamber at numerous joint working groups and committees with various Government bodies/agencies, and in particular the Ministry of Communications and Works and its Department of Merchant Shipping, with both of which, the Chamber maintains excellent relations. Furthermore, the Chamber is regularly called to appear before Parliamentary Committees as the representative body of the Shipping Industry in Cyprus, when matters affecting Cyprus Shipping are considered at the House of Representatives. The Chamber also cooperates with and actively participates therein as Member of numerous local professional trade and employers organisations, in an effort to improve and constantly enhance the shipping infrastructure of Cyprus.

In all its dealings with the various Ministries and Departments, the Chamber's primary objective is to assist the Government at all levels to adapt new and existing laws, policies and procedures to the needs of the Cyprus fleet and the resident Shipping Industry in a world which is highly competitive

and at the same time more conscious of the need to raise quality, improve safety and protect the environment. An example of the Chamber's co-operation with the Government is the active participation in the continuous harmonisation of Cyprus with the EU *Acquis Communautaire*.

The Chamber has also established a close co-operation with other private sector and semi-governmental organisations, such as the Cyprus Shipping Association, the Cyprus Ports Authority, the Cyprus Tourism Organisation, the Cyprus International Businesses Association, the Cyprus Association of Certified Public Accountants, the Cyprus Bar Association, the Institute of Chartered Shipbrokers, the Cyprus Marine Environment Protection Association, the Seafarers Unions, and many others. In addition, the Chamber participates the Boards of the Cyprus Industrialists and Employers Federation, the Cyprus Chamber of Commerce and Industry and the Cyprus Investment Promotion Agency.

The Chamber operates as a roving ambassador of Cyprus Shipping abroad, through its membership and active participation in the International Chamber of Shipping (ICS), the International Shipping Federation (ISF), the European Community Shipowners' Associations (ECSA), the Baltic and International Maritime Council (BIMCO) and the International Association of Independent Tanker Owners (INTERTANKO). Members of the Chamber also regularly participate in many international meetings, including the International Labour Organisation (ILO), International Maritime Organisation (IMO) and the European Union (EU) meetings in Geneva, London and Brussels and in a number of their Committees, where the Chamber functions as consultant to the Government representatives as part of the Cyprus Shipping delegation or as the representative of the Cyprus Shipping Industry.

As a result of this involvement, the Chamber is able to offer its Members, a constant source of up-to-date legislative, technical and commercial shipping information, and more importantly, operates as a lobby group for the promotion of the legitimate interests of its Member-companies, on a national as well as international level.

An aspect of the Chamber's efforts to improve the local maritime infrastructure that deserves special mention is the establishment of an Employment and Training Scheme for Office Personnel. Since 1993, suitably qualified school-leavers as well as existing staff of the Chamber's Member-companies are enrolled in courses administered by the Chamber, which lead to recognised qualifications of the Institute of Chartered Shipbrokers in London. A Branch of the Institute came into being in 1996 in Cyprus. The Chamber co-operates closely with the Branch in the administration of the courses called "Tutorship" and "Understanding Shipping". We have no doubt that by encouraging more young and well-trained people to enter the local maritime industry, we will have laid strong foundations for the development of a maritime tradition that will promote quality and safety.

The Chamber's intention in the years to come is to continue to serve its Members both nationally and internationally, whilst at the same time, promoting and enhancing the Cyprus flag as a highly reputable ship Registry that fully undertakes its international responsibilities with respect to quality shipping, marine safety and protection of the environment. The Chamber also aims to further improve the Cyprus Shipping infrastructure, establish better cooperation with the Government Ministries, Parliament and other professional bodies, enhance activities at international shipping organisations, and play an important role in national and international Shipping affairs.

Cyprus Maritime Academy

The University of Nicosia, the Arab Academy of Science, Technology and Maritime Transport, the Maritime Institute of the Eastern Mediterranean and Intercollege, signed an agreement in August 1st 2015, for the establishment of the **Maritime Academy in Cyprus.** The Academy will offer shipping-related courses taught in English to Cypriot and foreign students. The courses include Shipping & Logistics Management, Maritime Transport, Marine Engineering and Marine Electrical Technology. The availability of skilled human resources is at the very core of economic growth and employment in the maritime cluster as more and more of the maritime activities become knowledge dependent, therefore, access to high quality maritime education and training should be on top of the national agendas of all maritime nations.

The maritime courses offered will include security courses in accordance with STCW, courses on safety for the hydrocarbons industry (OPITO), courses for cooking on board vessels, port management and for captains of small vessels.

Cyprus Naval Architects & Marine Engineers Association

Cyprus Naval Architects & Marine Engineers Association was established in 1999. This became necessary by the rapid development of the shipping sector in Cyprus, which resulted in the number of scientists and professionals in the sector to increase substantially and to put on the table issues of promoting modern scientific concepts and claim their collective rights.

Today the shipping sector remains one of the most dynamic sectors to employ well-paid and skilled staff, which includes a large number of scientists working here in Cyprus. The shipping Sector as a predominantly technical sector – and not as a services sector as sometimes erroneously stated – requires the existence of such scientists. As mentioned above, a maritime county like Cyprus must have its own staff and its own marine infrastructure in order to support the industry.

In this context, the Association has set the following objectives:

1) The creation of independent Naval Architects and Marine Engineers sector in Cyprus Scientific and Technical Chamber (ETEK), in order to set an important and institutional engineering sector of Cyprus. Also providing to ETEK the capability for effective intervention in matters concerning engineers of the sector and assist the work of the Department of Merchant Shipping respectively;
2) Creation of a department of Marine Technology (Naval Architecture and Marine Engineering) at the Cyprus University of Technology (CUT). The needs of the industry in human resources is continuous and particularly in the areas of technical disciplines i.e. Naval Architects and Marine Engineers, in order for them to staff the responsible Department of Merchant Shipping as marine surveyors, and the private sector as engineers onboard ships and as technical superintendence onshore;
3) Creation of shipbuilding/ ship repair facilities in Cyprus characterized by consistency, efficiency and reliability something that is missing in the Eastern Mediterranean region and take advantage of the huge amount of merchant and naval ships passing through the area.
4) Promoting lifelong learning and training of members of the Association through academic degrees and training seminars for personal development and for optimizing services provided by the domestic industry;
5) Strengthening efforts to convert Cyprus, as the only European country in the Eastern Mediterranean region, in transportation and commercial hub in enhancing maritime links with countries in the region.

Right to enroll in the Association as Full Members have Cypriots and foreigners with permanent residence in Cyprus, Naval Architects / Naval Mechanical Engineers or related disciplines Engineers graduates from University recognized by the State or Chief Engineers of Merchant Ships who graduated from a minimum three years institute. While enrolled as Associate members qualified Engineers of other specialties proven to work in the shipping area.

Ministry of Education and Culture (MECC)

Recently, the Ministry of Education and Culture of Cyprus (MECC) has proceeded to modernise and restructure Secondary Technical and Vocational Education. Many influencing factors and agencies were assessed and they have contributed to the decision–making process. Changing industrial and employment conditions demanded consideration against the background of current international trends in Secondary Education, emerging instructional patterns and projected economic developments within Cyprus. The views and suggestions of the Technical Education teaching staff, of the Careers Advice Department for Technical and Vocational Education and of the Education Council were sought and harmonized.

As an inevitable consequence, major reorientation and modernization of Secondary Technical and Vocational Education (STVE) has become essential. Leading educators involved in STVE realise that adjustment to rapidly changing situations must be based upon the ability to acquire relevant new knowledge and to evaluate and develop effective new professional and instructional methodologies. Not only must they be able to make changes within the educational system to preserve its relevance to a changing world, but it is crucial for them to build a relevant knowledge and skills base that will be applicable in a variety of fields and professional sectors.

With Cyprus' accession to the European Union, all high school and college-level graduates are faced with greater professional competition from international sources. In order for these young persons to compete and survive within the contemporary working environment, they must acquire the relevant educational foundation – and the relevant vocational credentials to the accepted standard.

The European Credit system for Vocational Education and Training (ECVET) aims to give people greater control over their individual learning experiences and make it more attractive to move between different countries and different learning environments. The system aims to facilitate the validation, recognition and accumulation of work-related skills and knowledge acquired during a stay in another country or in different situations. It should ensure that these experiences contribute to vocational qualifications. ECVET aims for better compatibility between the different vocational education and training (VET) systems in place across Europe and their qualifications.

Higher Education:

At present, 3 public and 5 private universities operate in Cyprus. In addition, there are State Higher Education Institutions and about 40 Private Institutions of Higher Education in Cyprus.

State Higher Education Institutions:

Higher education in Cyprus is also provided by a number of State Higher Education Institutions, and an even greater number of Private Institutions of Higher Education, none of which has university status. The State Institutions of Higher Education, offer vocational programmes of study with a duration ranging from one to three academic years. These programmes do not provide access to second cycle programmes. The apolyterion or equivalent qualification, is a prerequisite for access to the programmes offered by State Higher Education Institutions and candidates for entrance to a particular programme are ranked according to their performance in the Pancyprian Examinations.

Private Institutions of Higher Education:

Currently, 40 Private Institutions of Higher Education are registered with the Ministry of Education and Culture. Private Institutions of Higher Education do not have university status but they offer both academic and vocational programmes of study at the undergraduate and postgraduate levels.

Quality Assurance and Accreditation

The competent body for quality assurance and accreditation of the programmes offered by Private Institutions of Higher Education is the Council for Educational Evaluation-Accreditation (Symvoulio Ekpedeftikis Axiologisis Pistopiisis, SEKAP), which is a member of ENQA. At present, a number of programmes offered by the Private Institutions, have been evaluated and accredited by SEKAP. These programmes fall into the following categories:

- Academic and Vocational programmes of study lead to the following qualifications: Certificate (1 year), Diploma (2 years) and Higher Diploma (3 years). For access to these programmes the apolyterion or equivalent qualification is a prerequisite;
- First cycle programmes (4 years), lead to the award of a Bachelor Degree. For access to these programmes the apolyterion or equivalent qualification is a prerequisite;
- Second cycle programmes (1 to 2 years) lead to the award of a Masters Degree. The prerequisite for access to these programmes is the Ptychio, or Bachelor, or equivalent qualification.

Recognition of Higher Education Qualifications

The competent national body for the recognition of higher education qualifications is the Cyprus Council for the Recognition of Degrees (Kypriako Symvoulio Anagnorisis Titlon Spoudon, KYSATS). KYSATS recognizes equivalence, or equivalence-correspondence for first cycle titles, or just equivalence for postgraduate titles (second or third cycle). KYSATS may also recognize joint degrees.

Quality Assurance Agency

The establishment of a Quality Assurance Agency has been approved by the Council of Ministers of the Republic of Cyprus. The aim of this Agency is to promote quality assurance in both the public and the private institutions of higher education, through various measures which include external accreditation and development of internal quality culture. These efforts are in line with the Berlin Communique, the ENQA Standards and Guidelines on QA, as accepted by the Bergen Communique and the Agreement on Quality Assurance in the EU.

Arab Academy for Science, Technology and Maritime Transport

The Arab Academy for Science, Technology & Maritime Transport (AAST) is a regional university operated by the Arab League which is known for its programs in Marine Transportation, Business and Engineering. The College's approach to education is based on a forward-looking vision anchored in reality. The College has been, and will continue to be, the model for maritime education and training in the world. The study programs combine formal academic studies leading to the B.Tech. Degree, course work and practical experience at sea qualifying for certification as Deck Officers (Third Mate, Second Mate, First Mate and Master), and Marine Engineer Officers (Third Engineer, Second Engineer and Chief Engineer).

The Academy's Maritime Affairs, The Higher Council for Maritime Affairs, was established in 2013 within the organisational structure of the Academy. It is headed by H.E. Professor Dr. Ismael Abdel Ghafar, the Academy's President. The Maritime Affairs comprise the following entities of the Maritime Sector:

- College of Maritime Transport and Technology;
- Maritime Upgrade Studies Institute;
- Maritime Safety Institute;
- Sea Training Institute;
- Regional Maritime Security Institute;
- Integrated Simulators Complex;
- Maritime Postgraduate Studies Institute;

- International Maritime Organisation Compound;
- Quality Maritime Education and Training Deanery;
- Maritime Research and Consultation Center.

The Maritime Affairs are primarily concerned with setting the strategies and mechanics necessary for the implementation, supervision and follow-up of the general policies concerned with Maritime Affairs at the internal, local and international level

Maritime Affairs also aim at achieving integration of the activities of the College of Maritime Transport and Technology and the Institutes specialized in Maritime Affairs, in addition to preparing the infrastructure necessary for supporting Maritime Education and Training Sector. The facilities include:

- Marine Simulators (Full Mission Ship Handling Simulator, Integrated Bridge System (IBS), TUG Boat Simulator, Small Fast Ship Simulator), Vessel Traffic Service Simulator (VTS), ECDIS Lab Simulator, Mini Bridge Simulator, Full Mission Engine Room Simulator, Offshore Simulators, Full Mission Offshore Vessel Simulator "Class A", Full Mission Offshore Crane Simulator "Class A", Dynamic Positioning Labs, Liquid Cargo & Natural Gas Simulators, Liquid Cargo Handling Simulator, Natural Gas & Petrochemicals Simulators);
- Engineering Workshop (Metals Workshop, Marine Diesel Engine Workshop, Marine Engineering Laboratory, Steam Laboratory);
- Global Maritime Distress & Safety System Simulators;
- Maritime & Offshore Safety Facilities (Swimming Pool Area, Modular Egress Training Simulator (METS), Helicopter Model on Helideck, Advanced Medical lab, E-learning Classroom, H2S control programs classroom (OPITO Approved));
- Fire Fighting Facilities (Fire Fighting Lab, Fire Ground);
- Environmental Protection & Crises Management Centre (The Crisis Management Simulator, Chemical Analysis Laboratory, Oil Spill Combating Training Center);
- Metrology Station;
- Diving Center;
- Training Vessel;
- Maritime Training & Sail Sports Center.

National Technical University of Athens, Greece, School of Naval Architecture and Marine Engineering

Founded in 1836, the National Technical University (NTUA) is Greece's oldest and most prestigious educational institution in the field of technology. Its School of Naval Architecture and Marine Engineering was founded in 1969 and comprises four Departments: Naval and Marine Hydrodynamics, Ship Design and Maritime Transport, Marine Engineering and Marine Structures. The School provides education and research in all fields of Naval Architecture and Marine Engineering, and in the related fields of Maritime Technology. Unlike the separate courses offered in some other universities, the NTUA degree course covers both naval architecture and marine engineering, producing well-qualified graduate naval architects and marine engineers.

The Department's research activities cover various disciplines in maritime transport and in the concurrent engineering approach to ship design and operation. Research subjects include:

- Ship design and optimisation;
- Development of Advanced Marine Vehicles concepts (mono- and multihulls);
- Development of techno-economic ship databases;
- Computer Aided Ship Design (CASD);
- Applications of artificial intelligence to ship design;
- Applications of Virtual Reality Models to ship design and life cycle;

- Applications of Computer-Aided Geometric Modelling (CAGD);
- Development of software tools for ship design and operation;
- Regulations of ship stability and maritime safety;
- Formal Safety Assessment of ship design and operation;
- Analysis of marine accidents;
- Risk-based ship design;
- Risk assessment techniques for communication and information exchange;
- Technological and human aspects of maritime efficiency and safety;
- Techno-economic studies of ship design and operation;
- Techno-economic specifications and shipbuilding contract;
- Economics of maritime transport;
- Short sea shipping and inland waterway transport;
- Maritime business administration;
- Operations research on marine pollution;
- Decision support tools for oil spill control;
- Technologies to optimise manpower onboard ships.

Presently, the School has grown from the original faculty of 3 to 28, with an additional 25 research and technical staff members and a student body of about 600 undergraduates, 100 post-graduate, and 75 doctoral students. By international standards, it is among the largest schools in its engineering discipline and it is commensurate to the prominence of the Greek merchant fleet in the World. Its product, consisting of well-educated and sought-after graduates and high quality research output, reflects strongly on the international recognition of the School by the profession and academia.

University of Piraeus- Department of Economics

E-Learning Executive Programs

This e-Learning program provides opportunities to study applied topics of Business, Economics, Finance, Education, History and Foreign Policy from a distance and get a University accredited certification. For example, it provides marketing, management and applied economics courses related to banking, tourism and health sector. The program operates under scientific guidance of the Department of Economics and the Research Centre of the University of Piraeus. Their aim is to educate students in applied and theoretical topics, using distance learning methodologies. The program refers to everyone who desires to improve their position in the labour market or enrich their knowledge and professional skills.

e-Lifelong Learning Programme (LLP) "Maritime Business Administration".

The program offers a broad overview of the maritime activities of a shipping company and the skills required by the office manager or the masters of the sea to promote their vision and company goals. It is also a powerful tool in the hands of a graduate who as a tangible result makes him ready to take on any position of responsibility in a company in the shipping and transport industry. The specialization programs are designed in such a way as to take account of the knowledge and skills required by the maritime and shipping sector.

Jordan Academy for Maritime Studies (JAMS)

JAMS is a private institution. It started its first academic year in 2004. The Academy campus lies on a lot of 4000 square meters located in Abu Nusair, one of the charming places of Amman, the capital of Jordan, and 35 km from Queen Alia International Airport. It is a quality focused maritime institution providing comprehensive services of Maritime Education and Training (MET) while committed to customers, employees, owners and the maritime community in general.

The idea of establishing JAMS, as the first of its type in Jordan, came into existence due to the high number of students who study abroad, and who spend large amount of hard currency as costs of their studies on the maritime sciences, as well as the provision of the local market with the required number of skilled and qualified personnel.

JAM's objectives

- To provide new career opportunities in the fields of Marine Engineering and Nautical Navigation.
- To provide highly skilled graduates capable of working in the fields of Marine Engineering and Ship Navigation.
- To conduct advanced research and studies on issues related to the development of Marine Engineering and Ship Navigation and Management.
- To develop, sponsor and coordinate training programs for marine competency certificates renewal as well as assisting the public and private sectors in implementation of techniques and methods for improving management skills.
- To develop relation with other institutions specialized in the same issue related to the sustainability of marine Engineering and Ship Navigation and Management.
- To hold national and international conferences on topics related to the application of science and technology in marine fields.

AL-Manar University of Tripoli (MUT)

MUT – Rashid Karami Institution for Higher Education is a private Lebanese University that was founded on the 15th of November, 1990. It is administered by "Al-Manar Society", a non-profit Islamic charitable organisation, founded in 1958 to establish learning institutions that serve students and businesses from Tripoli and the North in particular, to Lebanon and the Arab World in general.

Since its establishement by the late Prime Minister Mr. Rashid Karami, the Association has received a number of financial and real estate contributions including a 255,000 m2 lot of land in the Zeitoun region of Tripoli. After his assassination, H.E. Mr. Omar Karami assumed the chairmanship of the Society. He formed the Founders Committee, with a charge of creating the statute of the Foundation and the by-laws of the University, as well as MUt's Board of Trustees which he chairs, incorporating as members three former Lebanese Prime Ministers, a number of dignitaries, businessmen and academicians.

The University's by-laws target the number of students attending MUT during its first stage at 3000 students, spread out over the various Faculties and Institutes. Its licensing decree stipulates that all students attending Ai-Manar University must hold the Lebanese Baccalaureate. Part II Cetificate, or its equivalent as a prerequisite for admission.

The objectives include:

- To offer higher and quality education and research comparable to international standards, satisfying student's and society's needs for qualified knowledge.
- To graduate students that can easily meet the market needs and challenges.
- To promote the interaction between higher education institutes and the private sectors of industry and business by holding seminars, symposia and workshops to train students in the business filed while simultaneously continuing their studies.
- To contribute to the academic, economic and social development of North Lebanon in particular and Lebanon in general.
- The English language is the required medium of instruction at MUT.

Istanbul Technical University (ITU)

ITU is one of the world's oldest technical universities with a long history of 250 years.

ITU is a reputable institution known for its history, science, technology, art and sport achievements over the period of 242 years. It is a research centre connecting the past to the present and designing projects for the future. ITU, that has presented numerous scientific and technological developments, was the first to introduce novelties and unique achievements, provides academic learning being one of the oldest and most prominent technical universities in the world.

ITU offers 39 graduate programs at 13 faculties, 39 postgraduate and doctoral programs at 6 institutes on five different campuses, all of them located in the heart of Istanbul.

ITU has 360 laboratories and 13 research centers. With 23 engineering programs accredited by ABET Accreditation, ITU is the world's leader among universities. Students participating in International Exchange Graduate Programs complete a part of their education at one of the partner universities in the USA and receive a dual diploma. ITU offers a number of double major programs and is the top university in Turkey providing a broad range of Erasmus exchange programs with more than 900 international agreements.

ITU is the cradle of science, industry and technology conducting over 200 Ar-Ge projects in the scope of ARI Teknokent. In cooperation with the entrepreneurship ecosystem ITU Seed, the university provides support to students-entrepreneurs.

Turkey's first communication satellite, first electric mini bus, first hydrogen-powered boat, first driverless car, first national computer were launched by ITU. The first television broadcast in Turkey was made from ITU, the first university radio station was opened in ITU.

Long history, intelligent minds and outstanding academic environment of ITU form a strong bridge connecting the past to the future. With the priority for continuous development, innovative perspective and strong international contacts ITU proves to be the university of the past, present and future.

4.6 Athens Focus Group

National & Kapodistrian University of Athens, School of Pharmacy (NKUA)

The Faculty of Pharmacy at the National and Kapodistrian University of Athens is part of the School of Health Sciences, along with the Faculty of Medicine, Dentistry and Nursing. The National and Kapodistrian University of Athens (NKUA) is the oldest and largest educational institution in Greece covering all areas of sciences and arts. NKUA is located in Athens with spacious modern laboratories, libraries, restaurants, medical and athletic facilities.

The hosting Laboratory of Pharmacognosy belongs to the Department of Pharmacognosy and Chemistry of Natural Products. The research interests of the Laboratory of Pharmacognosy include:

- Isolation and structure elucidation of secondary metabolites with pharmacological activity from marine organisms.
- Structure - activity relationship studies and structural modifications directed towards activity enhancement.
- Isolation of marine microorganisms and chemical investigation of their secondary metabolism.
- Isolation of marine metabolites exhibiting settlement inhibition activity for the development of ecologically friendly marine paints.
- Development of methodology based on LC-DAD-MS and NMR aiming at the metabolomic fingerprinting of marine organisms.

- Bioconversions of bioactive secondary metabolites by marine-derived microorganisms aiming at the production of analogues and their biological activity evaluation thereof.
- Chemical interconversions of secondary metabolites aiming at the production of semisynthetic analogues for their biological activity evaluation and structure-activity relationship studies.
- Isolation of marine polysaccharides and development of nanofibers aiming at the production of new biomaterials for biomedical applications.
- Chemical ecology studies aiming at the elucidation of the role of secondary metabolites in the behaviour of organisms and application of them in environmentally friendly management systems.
- Chemotaxomical studies on Mediterranean plants and Marine organisms.
- Investigation of the pollution impact on the chemical nature of secondary metabolites produced by marine benthic organisms and applications of them toward the development of a biomonitoring indication system.

The hosting Laboratory of Pharmacognosy is housed in laboratories equipped with the scientific infrastructure including multinuclear NMR spectrometers, HPLC-DAD-MS and GC-MS systems, FT-IR and UV-Vis spectrophotometers, polarimeters, several HPLC and MPLC systems, lyophilizers, laminar flow hoods and appropriate facilities for microbiological work. For the collection of marine organisms, performance of field work and bioassays the group has a vessel equipped with modern navigation instruments, remote operated video cameras, remote operated vehicle (ROV), hydraulic winches and sediment corers.

In the undergraduate program Chemistry and Pharmacology of Bioactive Marine Natural Products are taught as part of the Pharmacognosy courses. In the postgraduate level an elective course entitled Marine Pharmacognosy is dedicated to the secondary metabolites isolated from marine macro- and microorganisms, while the bioactive compounds already in the market are included as part of the mandatory course Bioactive Natural Products.

The Aristotle University of Thessaloniki, Faculty of Sciences, School of Biology, (AUTH)

The Aristotle University of Thessaloniki is the largest university in Greece. The main campus is located in the centre of the city of Thessaloniki, and covers an area of about 33.4 hectares. It comprises 10 faculties, which consist of 40 schools and 1 single-School Faculty. About 73,930 students study at the Aristotle University (65,026 in undergraduate programmes and 8,472 in postgraduate programmes, of which 3,952 at Doctoral level). There are 2,024 faculty members. Faculty members are also assisted by 213 members of the Special Technical Laboratory Personnel (S.T.L.P.). The administration office consists of 400 permanent employees and 528 employees under a private law contract of indefinite duration. Moreover, 596 people employed by third parties provide services at the University.

The School of Biology was founded in 1973 when the School of Natural Sciences was divided into the School of Biology and the School of Geology. Its programmes train students in a wide variety of disciplines related to biology ranging from genetics and developmental and molecular biology to ecology, conservation biology, zoology and botany. Education and training meet the increasing needs of the constantly changing fields of Biology, as well as the needs and demands of modern society. The School of Biology offers high-quality education, implementing state of the art teaching methods and providing students with theoretical and practical training directly related to their main field of study. Faculty members conduct basic and applied research on a wide range of topics, having at their disposal the required equipment and infrastructure.

In the School of Biology, aquaculture and blue biotechnology are part of the undergraduate and mainly post graduate activities. Especially the Department of Genetics, Development & Molecular Biology is combining research on applied aquaculture and biotechnology. The Laboratory of Professor Abatzopoulos is doing research that include the study of the biology and evolutionary genetics of aquatic organisms focusing on temporary brackish/hypersaline ecosystems and their biodiversity. The laboratory emphasizes on genetic characterization, development of markers, molecular systematics, phylogeography and phylogenetics of anostracans (*Artemia* and *Branchinella spinosa*), *Brachionus* rotifers, microalgae and various fish (*Silurus* spp., *Aphanius fasciatus*, *Dicentrarchus labrax* and *Sparus aurata*), development/use of molecular markers, coastal management, genetic pollution mainly caused by escapees, anticipation of commercial fraud, etc.

University of Zagreb, Faculty of Pharmacy and Biochemistry, Croatia (UZFBF)

The University of Zagreb (1669) is the oldest and biggest university in South-Eastern Europe. Ever since its foundation, the University has been continually growing and developing and now consists 29 faculties, three art academies and the Centre for Croatian Studies. With its comprehensive programmes and over 50,000 full-time undergraduate and postgraduate students the University is the strongest teaching institution in Croatia. It offers a wide range of academic degree courses leading to Bachelor's, Master's and Doctoral degrees in the following fields: Arts, Biomedicine, Biotechnology, Engineering, Humanities, Natural and Social Sciences. It is also a strongly research-oriented institution, contributing with over 50% to the total research output of the country.

The Faculty of Pharmacy and Biochemistry (FBF) offers two Integrated undergraduate and graduate university programmes in Pharmacy and Medical Biochemistry. Four courses are currently offered in English. Medicinal chemistry (3,5 ECTS), Personalized Healthcare (2 ECTS), Nutrition/Diet therapy (2,5 ECTS) in autumn term and Phytotherapy (2,5 ECTS) in spring term. Additionally, students can enroll courses in English at other Faculties of the University. In addition, international students can also ask for tutorial classes in courses usually taught in Croatian. Both international and local students can ask for placements in laboratories where they can perform their research.

FBF has a significant scientific activity in the fields of natural sciences and biomedicine and health sciences, especially in the field of pharmacy and medical biochemistry. Today, the FBF, with a tradition of 132 years (pharmacy) and 50 years (biochemistry), with 153 employees (of which 61 in the scientific and teaching positions) and currently 204 postgraduate students, is one of the important scientific institutions of the University of Zagreb. FBF and its employees, in various forms are cooperating with 31 foreign institutions and is part of the Central European Exchange Program for University Studies (CEEPUS) and the ERASMUS program.

Research activities on FBF is visible in 24 scientific research projects granted by the Croatian Ministry of Science and Education, three major international projects, four bilateral and eight professional projects and cooperation. To date, more than 10,000 graduates, with more than 300 master's and over 200 doctoral theses, shows that FBF significantly increased scientific potential of the Republic of Croatia and became a constant source of scientific and teaching activities at the national and international level. FBF has strong links with the University of Athens and Prof. Roussis.

Oceanography Centre, University of Cyprus (UCY)

The University of Cyprus (UCY) was established in 1989 and admitted its first students in 1992. It was founded in response to the growing intellectual needs of the Cypriot people, and is well placed to fulfil the numerous aspirations of the country. There are now 8 faculties, 22 departments and 11 research units at UCY.

The Oceanography Center (OC), the first research unit of the Faculty of Pure and Applied Sciences, which was founded in October of 2010 with an ambitious goal: the development of marine research focusing on the Eastern Mediterranean. The research activities of the Oceanography Center principally cover the following areas:

1. Physical Oceanography
   - Arithmetic modeling: circulation, sea state, dispersion.
   - Remote sensing: in-situ and satellite.
   - Observation: coastal research cruises, open sea research cruises, autonomous underwater vehicles.
2. Operational Oceanography
3. Biological Oceanography
4. Oceanographic databases

The OC aims to promote research and function as the starting point of new research projects and ideas relating to marine sciences. The OC is open to research collaborations with young or experienced researchers and with any organisation involved with marine sciences and with the marine environment. The mission of the OC is to conduct basic and applied research in the fields of ocean physics and dynamics, remote sensing, operational oceanography, biological and chemical oceanography, environmental assessments, dedicated ocean and marine data and meta databases and information systems, etc. The OC aims to contribute through research in the increase of the scientific knowledge of the EEZ of Cyprus in the Levantine Basin and the Mediterranean. In addition it aims to improve and develop various components of operational monitoring and forecasting of the marine system at local, sub-regional and regional scales.

Moreover, the Center aims to operate the Cyprus coastal ocean forecasting and observing system (CYCOFOS) in cooperation with existing operational ocean forecasting networks in Europe and the Mediterranean (MONGOOS, MyOCEAN) within the scopes of EuroGOOS and GMES-Copernicus as well as to demonstrate and provide information regarding the marine environment to decision makers, key end users and to the public. Furthermore, the Center is keen to offer consulting services to government and private sectors (e.g. search and rescue, oil spill pollution, pelagic fisheries, fish farming, desalination plants, disposal of industrial effluent, oil and gas industry).

The Agricultural Research Institute, Cyprus (ARI)

The Agricultural Research Institute (ARI) is a department of the Ministry of Agriculture, Natural Resources and Environment and its headquarters are situated at Athalassa, in the outskirts of Nicosia. It was established in 1962 as a cooperative project between the government of Cyprus and the UNDP, with FAO acting as the executive agency, and was entrusted to the government of Cyprus in 1967.

It is a Governmental, non-profit Research institution engaged in agricultural research and depends almost exclusively on government funding. In 2000, it has been selected by the EU as "Centre of Excellence in Agriculture and Environment". It has, today, 31 Professional and 31 Technical Staff. Most of the Professional Staff are PhD holders and the remained with M.Sc.

The institute undertakes applied and adaptive research within the wider domain of plant and animal production. It evaluates under local conditions, resent scientific and technological findings owning at maximizing the utilization of resources and improve animal and plant production. Important disciplines of research, such as Field Crops, Horticulture, Agricultural Engineering, Plant Protection, Soils and Water Use, Animal Production, Rural Development, Agrobiotechnology, Agricultural Economics, Biometry and Information Technology, coexist under the same roof ensuring cooperation among scientists of different disciplines and efficient use of facilities. It also has a

central chemistry laboratory providing analytical backup services and pursuing experimental work on pesticide residue analysis. The institute has well equipped specialized laboratories, including a radioisotope laboratory, cold storage facilities, a gene bank, a herbarium, an insectary, glasshouses and a library which receives most of the leading agricultural journals. The institute has an experimental farm, near HQs, where the livestock (cattle, sheep, goats) is kept, and outstations at Achelia and Zyghi for citrus, vegetables and field crops, and at Saittas for deciduous fruits. Extensive experimentation is also undertaken in farmers' fields.

The institute's work is published in international journals or in its own publications series (annual review, technical bulletin, miscellaneous reports, agricultural economics report) in English. The institute is the national AGRIS centre, collecting, cataloguing and indexing the agricultural literature published in Cyprus, and is also the national CARIS centre collating information on on-going research. All this information is supplied to FAO for inclusion in the global databases of the AGRIS and CARIS systems.

The activity of Agricultural and Horticultural Engineering at the ARI, dealing with the engineering aspects of hydroponic systems, climate control of Greenhouses, use of renewable energy sources in agriculture and drying of agricultural products, is housed under the Section of Soils Science. Research is carried out in the fields of renewable energy (selection and cultivation of energy plants and microalgae for production of biodiesel, bioethanol, solid biomass fuels, and biogas, use of solar and shallow geothermal energy for greenhouse heating and for drying herbs and aromatic plants, etc.) and energy efficiency. Within this section research is also carried out in subjects regarding efficient water and fertilizer use in agriculture, safe reuse of recycled water in agriculture, soil fertility improvement to combat desertification resulting from climate change, composting of biomass, etc. ARI is also involved in training of Farmers, Agronomists and Students in the field of Greenhouse management and application of New Technology in Horticulture/Agriculture.

ARI is coordinating the project "Production of biodiesel from Algae in selected Mediterranean Countries" (MED-ALGAE), a 2 million € project that is implemented under the ENPI CBC Mediterranean Sea Basin Programme and has a duration of 36 months. The consortium is consisted of 12 organisations: research organisations, academic institutions, energy agencies, private organisations from 6 countries: Cyprus, Greece, Italy, Malta, Lebanon and Egypt.

Suez Canal University

The history of Suez Canal University dates back to 1976 and began operation in 1977 in six faculties, namely, the faculty of science, the faculty of agriculture, the faculty of commerce, the faculty of engineering and technology (in Port Said) and the faculty of education (in Suez). In the 1980s and 1990s, steady expansion in the university has been going on with a new faculty opening its doors almost every year. Today, there are 49,588 students registered at the University studying in more than 20 faculties distributed in more than 6 Branches located in Ismailia, Port Said, and Suez and El-Arish. Two more faculties, one for arts and humanities and the other for fish, are to be established soon. The number of senior staff members today exceeds 1,497 assisted by 1,485 junior staff, members teaching to more than 74,097 at the undergraduate level. Till now, 87,500 students have received their first degree from the university, in addition to 15,082 who have received different graduate degrees.

The Faculty of Pharmacy of the Suez Canal University is one of the 13 Faculties of Pharmacy that operate in Egypt. It seeks to be one of the leading educational colleges at both the local and international levels. The Faculty of Pharmacy will be recognized for its impact on the health care needs of the community through its contributions in education, scientific research and service to the civil community.

Dr. Diaa Youssef is a Professor of Natural Products Chemistry & Medicinal Chemistry. He received his educational training at Assiut University, Egypt where he earned a Bachelor of Pharmacy (with honor) in 1984 and a Master of Science (MSc) from the same University in 1988. In 1995, he received his PhD at Albert Ludwig University in Freiburg (Germany) with the grade “magna cum laude”. His major specialty is Natural Products Chemistry from both marine and terrestrial sources. After a one-year postdoc in Germany, he joined Suez Canal University (SCU) as an Assistant Professor in 1996. In 1999, he received the renowned US Fulbright Scholarship to stay for one year at the University of Hawaii at Manoa (USA) and was promoted to Associate Professor in 2001. In 2002, he awarded another international reputable Japanese fellowship for Visiting Professors from the Japanese Society for Promotion of Science (J.S.P.S.) to The University of Tokyo (Japan). He was a Visiting Professor to several US universities including Scripps Institution of Oceanography at UCSD and University of Utah. He was promoted to Full Professor at SCU in 2006 and he remained with SCU until 2010. Before leaving SCU to join King Abdulaziz University (KAU), Dr. Youssef was Acting Dean of College of Pharmacy, Vice Dean for Research and Professor at Department of Pharmacognosy at SCU. At SCU, he built a rigorous research program in the area of marine biotechnology, marine natural products and drug discovery from scratch at Suez Canal University, gaining recognition as the Chair of the Department of Pharmacognosy. He has been a “Principal Investigator” of 15 research projects in the area of drug discovery from marine organisms and marine biotechnology. He has 70 peer-reviewed research papers, 27 invited presentations and two pending patents. He has supervised 15 MSc and 7 PhD students. In 2008, he was selected to chair and organize the 1st Euro-Mediterranean Conference on Marine Natural Products in Sharm El-Sheikh (Egypt). He continues to serve as a reviewer for more than 10 international reputable scientific journals in the area of chemistry of natural products, marine biotechnology and drug discovery. Dr. Youssef received the prestigious “State of Egypt Incentive Award in Medicine” in 2003 and the Dr. Hefni Saber Best Research Award (Cairo University) in 2004. A major focus of his laboratory is the discovery and identification of new drugs/drug leads for the treatment of human diseases. His current research support at KAU focuses on the exploitation of the marine organisms from the Saudi Red Sea coast as a possible source for drug discovery with special emphasis on marine sponges, tunicates, cyanobacteria, actinomycetes and fungi. His research activities include:

- Drug discovery and biomaterials.
- Marine biotechnology and marine natural products.
- Marine microbes as a source of novel pharmaceuticals and agrochemicals.
- Discovery of anticancer, and anti-infective drug leads from marine invertebrates.
- Semisynthesis and biocatalysis of natural products.
- Marine toxins.
- Marine chemical ecology and symbiosis in marine invertebrates.
- Water pollution and its impact on public health.

WorldFish Centre, Regional Centre for Africa & W/Asia, Abbassa, Egypt

WorldFish is an international, non-profit research organisation that harnesses the potential of fisheries and aquaculture to reduce hunger and poverty. In the developing world, more than one billion poor people obtain most of their animal protein from fish and 250 million depend on fishing and aquaculture for their livelihoods. Its mission is to reduce poverty and hunger by improving fisheries and aquaculture. It strives to achieve large scale, environmentally sustainable, increases in supply and access to fish at affordable prices for poor consumers in developing countries.

WorldFish works in Africa, Asia and the Pacific. It locate its research programs in regions where there are high levels of poverty and food and nutrition insecurity and where fisheries and aquaculture provide a significant amount of the animal-source protein and are vital sources of

livelihoods. WorldFish base its research in regional contexts so that it can engage closely with national partners to achieve substantial development impact.

WorldFish uses its technical and scientific expertise in fisheries and aquaculture to promote evidence-based development solutions that help the millions who are dependent on fish for food and livelihoods. WorldFish is a member of CGIAR, a global agriculture research partnership for a food secure future. WorldFish focuses its expertise and research in the following areas:

- Sustainably increasing the productivity of small-scale aquaculture.
- Improving nutrition and health through fisheries and aquaculture.
- Building adaptive capacity to climate change in fisheries and aquaculture.
- Identifying and promoting policies and practices to increase the resilience of small-scale fisheries.
- Strengthening gender equality in fish-dependent communities.
- Increasing the benefits to poor people from fisheries and aquaculture value chains.

Opened in 1998, the WorldFish Abbassa Research Center in Sharkia, Egypt has played an important role in the development of the aquaculture sector in both Egypt and sub-Saharan Africa. The Center at Abbassa is a regional center of excellence for genetics research, training in best management practices and fostering innovation and entrepreneurship in the African aquaculture sector. The Abbassa Research Center has developed faster growing strains of tilapia and catfish and trained more than 1,500 governmental officers, university staff, farmers, extension agents and researchers from 100 countries on aquaculture best management practices.

Egypt faces a growing population and shrinking supplies of water. The Ministry of Agriculture recognizes that increasing crop and livestock production per unit of water and land is an essential priority. Fish has been identified as one of the two most important livestock sub-sectors for future national food security. Today, aquaculture sector in Egypt employs more than 140,000 people and production has risen to more than one million tons per year, almost all of which is consumed in country, providing the equivalent of one fish per person per week. However, to meet the growing demand for fish in the face of static returns from capture fisheries, new supplies will have to come from aquaculture and increasing the productivity of already existing fish farms. In Egypt, WorldFish focuses its research in the following areas:

- Increasing the benefits to poor Egyptians including women and youth from fisheries and aquaculture value chains;
- Sustainably increasing the productivity of existing Egyptian fish farms;
- Improving nutrition and health of consumers through sustainable improvements in fish supplies from fisheries and aquaculture;
- Promoting sustainable and equitable aquaculture and fisheries policies and practices;
- Improving livelihoods and working conditions for value chain actors; and
- Minimizing environmental impacts of aquaculture systems.

Istituto di Chimica Biomolecolare, Napoli (ICB)

The mission of the Institute of Biomolecular Chemistry (ICB) consists of the chemical study of biological systems and processes to understand their function at the molecular level and explore their new technological applications. ICB operates in the fields of bioorganic chemistry and chemical biology, with expertise in the disciplines of spectroscopy, structural and synthetic chemistry, biochemistry, molecular modeling, microbiology, pharmacology, nutraceutics and bioenergetics. It operates under the umbrella of the Italian National Research Council (CNR). ICB was originally conceived as a National Institute originating from the merge of 6 previous CNR Institutes and Centers. Such National Institute was initially named “National Coordination Institute

for the Chemistry of Biological Systems (INC-CSB)". As of 2014, ICB is composed of 4 branches only: Naples, Catania, Sassari and Padua.

The mission of ICB consists of the chemical study of biological systems and processes to understand their function at the molecular level and explore their new technological applications. ICB personnel has expertise in fields ranging from basic chemistry to biology, for the development of molecules and processes of biological interest through multi- and inter-disciplinary approaches. Within the diversities of the methodologies employed by the personnel and of the objectives pursued by the researchers, ICB research activity is centered on organic molecules and their biological properties seen as:

1) Pieces of a puzzle of growing complexity, from single metabolic steps to interactions between different organisms;
2) Tools to be used to obtain a desired biological effect and to exploit metabolic processes of biotechnological importance.

ICB operates in the fields of bioorganic chemistry and chemical biology, with expertise in the disciplines of spectroscopy, structural and synthetic chemistry, biochemistry, molecular modeling, microbiology, pharmacology, nutraceutics and bioenergetics. ICB activities range from basic research on biomolecules and bioprocesses to their biotechnological applications in the following sectors:

- Health (development of new active principles, understanding of physiological and pathological mechanisms);
- Energy (development of bio-fuels and other renewable bioenergetics resources);
- Environment (understanding and counteraction of biological invasion phenomena, recycling of potentially polluting industrial waste products);
- Agriculture and Food Industry (study and amelioration of species with nutritional value, identification of active principles for the nutraceutic, cosmetic and veterinary use).

The group of BioOrganic Chemistry, headed by Dr. Fontana, is focusing on the structure elucidation of health-oriented natural products and eco-physiological mediators from marine eukaryotes, and on the characterization and regulation of biosynthetic pathways in marine organisms. The present interests concern:

- bioassay-guided identification and synthesis of novel marine compounds with anti-tumor, anti-infective and immunomodulatory potential;
- role and biosynthesis of chemical mediators in marine organisms, mainly protists and invertebrates;
- metabolism of hydrogen-producing bacteria;
- biomass and biofuels from marine microalgae.

Dr. Fontana holds 5 patents including a "Device for injection of CO_2 and other gases in culture chambers of photosynthetic microorganisms" and "New active marine alkaloids".

University of Udine, Department of Food Science, Italy (UNIUD)

The University of Udine (UNIUD) was founded in 1978 as part of the reconstruction plan of Friuli after the earthquake in 1976. Its aim was to provide the Friulian community with an independent centre for advanced training in cultural and scientific studies. The University currently has the following degree programmes in: Veterinary Medicine, Agriculture, Economics, Engineering, Law, Modern Languages, Communication and Training, Humanities, Medicine and Surgery and Mathematics, Computer Science and Multimedia.

The UNIUD is actively involved in student and staff exchange projects with universities within the EU and is currently engaged in close collaboration with several universities from Eastern Europe and other non-EU countries. Moreover the University participates in many research projects at national and international level. The present number of students enrolled at the University is approx. 17,000.

Udine and its University are a point of reference in a region which is historically a meeting place and crossroads of different worlds and cultures. Geographically situated in the centre of the European Union, the University of Udine plays an active role in a close network of relations, committed to sharing its knowledge and ideas. Since its establishment, Udine University has pursued the policy of internationalisation, aimed at preparing students and forging relations and partnerships with universities and institutions in Europe and the rest of the world. Udine University collaborates not only within Europe but across the globe and has long-standing connections with Africa, India and China. The University of Udine encourage the internazionalisation with several international agreements all over the world. More than 400 agreements have been signed within the framework of Erasmus+ and many others international agreements for the mobility of students and professors have been drawn up.

Professor Marco Galeotti has frequently constituted and co-ordinated multidisciplinary workshops which discussed important themes of interest in the sector of hygiene of animals, hygiene and security of animal origin food, animal production, aquaculture and fish pathology. Current research activities include:

- Study of agents causing infectious diseases of fresh water and marine fish.
- Study of immune system of fish, evaluation of the immunological parameters to control the efficiency of the immune response, after vaccination, immunostimulation, stress response.
- Research on causative agents of fish diseases and pathogenesis.
- Biomolecular research on fish immune system and applied research on vaccine development

Marine Science Station (MSS) Aqaba - Jordan University

The University of Jordan is both a modern as well as old institution of Higher Education in Jordan. Established in 1962, the University has, since then, applied itself to the advancement of knowledge no less than to its dissemination. In its capacity as a comprehensive teaching, research and community-service institution, the University of Jordan enables its students to choose from a wide range of programs- more than 3500 different courses are offered by some 18 faculties.

The establishment of The University of Jordan branch in Aqaba comes as a direct translation of His Majesty King Abdullah II`s vision for the future of the Aqaba region, which is the first and foremost national strategic and economic project directly supported by His Majesty who laid the cornerstone for The University of Jordan (UJ)- Aqaba Branch on April 30, 2009. The UJ-Aqaba Branch started teaching in a record time, at the start of the academic year 2009/2010 in September. The Faculty of Marine Sciences (FMSC) was one of faculties established at the first stage of the project. The FMSC is located in the main campus, which helps the interaction of Aqaba the faculty and students with other faculties, departments, and governmental institutions and private companies. The close proximity of the campus to King Hussein International Airport helps and facilitates the movement of researchers, scientists and academic staff of the branch. One of the important pillars for the success of the FMSC is the presence of the Marine Science Station (MSS), which was established in 1974 as a research center on the south coast of Aqaba. It provides FMSC with qualified staff and researchers, lab supervisors and technicians, and the required teaching and research laboratories. In 2013 and in conjunction with the graduation of the first batch of students from the faculty, the department began offering the Master (M.Sc.) degree of Marine Sciences. The program is designed to provide its graduates with the knowledge and skills that makes them competent in the various

marine fields. Due to the interdisciplinary nature of modern marine sciences, both departments: Marine Biology and Coastal Environment are jointly supporting this program.

Annex 7: Focus Group Reports

4.1 "The role of clusters to promote synergies in the maritime education and training offer" - Barcelona, Spain

4.1.1 Context

Barcelona was proposed as focus group location in the Western Mediterranean sub-sea basin. The focus group has been hosted by the Barcelona Cluster Nautic, a body which brings together various organisations from the private sector and which works intensively with regional universities to actively pursue actions in the area of education, clusters and international cooperation as cornerstone of any new developments taking place in this field (see http://www.barcelonaclusternautic.cat/en/home).

The title proposed for the focus group was "**The role of clusters to promote synergies in the maritime education and training offer".** The focus groups brought together stakeholders from the education sector, the industry and decision makers at regional and local level to discuss:

- How key stakeholders categories (public authorities, private stakeholders and the education & training world) can jointly ensure a coherent link between the provision of education and training and the development of maritime economic activities, notably tourism-related activities such as cruise shipping;
- Potential benefits derived from maritime education & training cooperation and networks as well as of obstacles and bottlenecks in the development of networks among maritime institutes and organisations in the Mediterranean.

4.1.2 Process leading to the focus group

During the first phase of the study (mapping), Barcelona and the Barcelona Cluster Nautic were already identified as an important initiative in the region. The team – encouraged by exchanges with DG MARE staff – subsequently approached the Cluster which quickly agreed to cooperate and host such a focus group.

The cluster was very active during the whole process and a key element to identify and reach participants.

4.1.3 Profile of the participants

The participants attending the Focus Groups covered the entire spectrum of institutions responsible for designing and providing the maritime education and training offer in Barcelona, and by extension in the region of Catalonia. In particular, the session counted with the participation of representatives from the education institutions (both higher and VET education) in the maritime field, representatives from the Business, Industry and Trade sector, namely, the Barcelona Cluster Nautic, the Chamber of Commerce of Barcelona and two representative companies and also the regional and local government. The event was enriched with the assistance of leading international organisations in the Mediterranean such as the Union for Mediterranean, the Inter-Mediterranean commission of the CPMR (Conference of Peripheral Maritime Regions) and a European Neighbourhood and Partnership Instrument (ENPI) project led by the Chamber of Commerce of Seville devoted to support and foster exchanges initiatives of student in the Mediterranean countries.

4.1.4 How to ensure links between education/training and the development of maritime economic activities?

This session of the focus group centred around the common challenge of closing the gap between the existing training offer and what the labour market demands in the context of maritime economic activities, notably tourism-related activities such as cruise shipping.

In other words, how the different actors and stakeholders – public authorities, training providers and the private sector – can organise themselves and set up a collaborative framework in order to better comply with the needs of a new sector that is bringing more and more job opportunities in Barcelona's metropolitan area, and that has to deal with the growing flow of big boats and cruise shipping coming to the port of Barcelona.

Cooperation, networks and clusters: a success story

The group identified cooperation, networks and clusters as the key working concepts in order to achieve progress in this respect.

A success story was identified right at the beginning of the discussions, whereby a cooperation framework was established between the City Council of Barcelona, the Barcelona Foundation for VET development (representing VET training providers), and Marina Barcelona 92 S.A., a private company. This cooperation framework took place under the umbrella of the Barcelona Nautic Cluster that is the organisation where all these organisations get together in order to discuss and explore opportunities to boost economic activity, raise innovation standards and create new jobs in the nautical-tourism related sector.

This cooperation framework, denominated as Vocational and Educational Training On Board (VET ON BOARD), has held already three editions with students and job placements in cruises operating in the port of Barcelona have taken place.

In fact, participants did not want to denominate this as a `project´, but rather as a `reality´ which is on-going and sustainable in time, as it is producing job placements and stimulating this particular maritime related area.

Participants explained that what is considered as the cornerstone of the success of this story was the fact that no new curricula were created `ad hoc´, but from an existing demand of sea related jobs offers, existing VET curricula such as carpenter, electronics, hostelry, etc., were adapted to the sea, meaning that professionals of the sea were integrating in the training programmes new knowledge domains referring specifically to the sea: "to be a carpenter in a big ship is not the same as being a carpenter in a big house".

The cluster acting as facilitator/catalyser for cooperation

The different actors working together under the umbrella of the Nautic Cluster denominated this process as a sort of "maritimisation", referring to this concept as making something more maritime-focused. In this case, making a VET curriculum and the students become closer to the sea and its specific particularities.

This process was also regarded by participants as more efficient than just "creating or setting up a brand new nautical VET curriculum", which is something that will eat more resources and not necessarily will bring the same results.

If the private sector goes to the VET schools looking for talent in electronics, stewards, carpentry, etc., then it would be just a question of making these profiles/students/potential future employees more “maritime”, so, as one of the participants expressed: “we open new future job opportunities at schools where they are already preparing good professionals, increasing the scope of the schools and improving the potential of young people”.

Many times participants expressed the same idea that all the above could only be achieved because of cooperation, working in different networks and the decisive role of the cluster, facilitating contacts and playing a brokerage role which is very highly valued. It cannot be forgotten that the cluster itself counts as active members the companies that will ultimately hire these students, which have been trained in accordance with the needs expressed by them.

A need to step up further cooperation with the private sector

Both the representative of the Government of Catalonia and the representative of the port of Barcelona once again indicated that “everything which is done in cooperation with someone succeeds, and this cooperation, especially with the private sector, needs to become more formal”.

This formalisation of the relationship can be twofold:

- Firstly, through the “Dual Model” (Modelo Dual de Formación Profesional, in Spanish), whereby a number of credits of the student are directly taken in a company and in the framework of a working environment;
- Develop more cooperation lines in parallel to the above mentioned “Dual Model”.

For the latter, it was commonly agreed that the business community has to see the training centres as opportunities to capture talent and the training centres need to adapt their processes and ways of doing things to the companies, integrating more and more teachers and trainers to the potential future employers.

Another step forward in bringing closer the private sector and the training providers can be represented with the actual evaluation systems. On this, it was argued that the present evaluation mechanisms whereby the company that hosted the job placement provides a final mark and with form that milestones puts an end to its participation in the process should be improved. This improvement would involve that the company continues with the evaluation process while the new employee completes his/her first two years of working experience.

If the training providers get that information on how it went, this would imply critical information in order to improve their training programmes as first hand information from the employer would be secured, identifying the strengths and the aspects for improvement on the quality of the education received by the students.

Models that work should be shared looking for good practices to improve

The Union for the Mediterranean representative brought up the issue that this type of models, which have proved successful should be used as basis for exchanges of good practices with other territories and operators.

In this way, good practices should be extracted and adapted to the context of the relevant territory/area.

On this particular topic, participants expressed their concerns about just “bringing something that works to Barcelona”. The real challenge and the objective should be to create the “Barcelona Model” from the good practices observed somewhere else.

An example of this was a working mission done by the cluster some years ago to one of the most world famous sailing regattas in the world, Les voiles de Saint Tropez.

Saint Tropez was considered a very good model to follow, but practice would show that it was not possible to just take that model and import it to the area of Barcelona, but rather to create the Barcelona sailing week, taking into account the particularities of the area, the existing entrepreneurial world, the Spanish legal system and all other particularities.

A positive trend is perceived, but still a long way to go...

The final point for this session centred around the perception from participants of how things have developed over time.

In the year 1992 (Olympic Games), Barcelona opened up itself to the sea, but “Barcelona did not get involved with the sea”, as the representative from the port of Barcelona pointed out.

Cooperation and this type of clusters are making a difference and achieving substantial progress as all actors working in common have discovered that there are a number of elements, that put together, can generate remarkable results.

A concrete example on this comes with the fact that, every year, over 100 000 seafarers pass through the port of Barcelona. Very few of them are Catalan-Spanish and the vast majority comes from abroad. This needs to be regarded as a great opportunity for growth and jobs. For the latter on job creation, it was also stressed the fact that unemployment rates among young people score among the highest in the EU and taking opportunities coming from sea-related activities (such as yachting and cruises) could really make a difference.

On the above, training providers play a fundamental role in preparing the country’s work force to take the challenge, by making the current training offer more adapted and tailored to the requirements of the private sector. An impressive figure is that Royal Caribbean alone employed 5 000 people for its cruise fleet in year 2015.

So, Barcelona needs to keep up with the good work, secure the opportunities coming from this sector and work towards the future with the objective of turning the city into a world reference with respect to nautical services and activities, and this can only be achieved if clusters and cooperation between stakeholders take place in an efficient way.

4.1.5 Potential benefits deriving from maritime education & training cooperation and networks as well as of obstacles and bottlenecks

The third session of the Focus Group was focussed on debating about the networking experiences in the international (Mediterranean) sphere in order to identify the benefits and challenges derived from networking in the field of education and training in the maritime field.

With this purpose the main benefits and challenges (barriers) of cooperation identified through the desk research and consultation already made in the framework of the study were shown to the audience and are presented in the table below:

Table 7.1. Potential benefits and challenges related to maritime cooperation

Benefits	Challenges
1) Understand the current challenges and opportunities, as well as bottlenecks, in order to adapt accordingly; 2) Offer new courses and/or certifications linked to new and growing maritime sectors; 3) Improve the quality of currently offered courses and/or certifications; 4) Harmonise their approaches concerning education and training programmes and certifications; 5) Co-operate with the industry (including possible participation in the networks) to match education and training offers with the marine and maritime sector's needs; 6) Follow the European Qualifications Framework; 7) increase opportunities for learning mobility and participation in exchange programmes, both for students and teachers.	1) Lack of understanding and interest in the maritime sector by institutions and education organisations; 2) Need to create more awareness – importance of collaboration particularly with and between institutions; 3) Differences in the provision of education and training, notably in the development of competences and delivery of certificates which are often recognised only at the national level; 4) Financial barriers which will not allow the continuation of cooperation unless new funding schemes are made available. Capacity to work in a network while actors are participating in a project; 5) Difficulties in ensuring the continuation of project-based networks of collaboration in the long-term; 6) Need to create financial instruments for the sustainability of networks, not only for their set up or creation; 7) Challenges related to the fact that Maritime education systems respond to a national system of academic job titles and academic reconnaissance. 8) There is a need to create a clear common recognition system that clearly links the different academic titles displayed by the different National Educative institutions

Taking these elements as a starting point, the participants shared their own experiences to illustrate the benefits and challenges of cooperation.

Benefits

On the benefits, the following elements arose from the debate:

The experience of the University – Cooperation as a key element to improve the competitiveness of the sector

The UPC is very active in participating in education and training networks. In this sense, they are member of the networks IAMU (International Association of Maritime Universities, which is a thematic network, not focussed in any specific region, although, as they indicated, at the end of the day you stick together with the European members (i.e. which those members with whom you share commonalities).

The functioning of the networks is as follows. They both organize annual meetings which are divided into two different parts. First, a conference to identify and discuss international trends in terms of education and research. Second more practical sessions where all members sit together and exchange experiences and lessons learnt in their domains.

Also the Erasmus initiative is key for the purpose of fostering cooperation. It contributes to build a common identity, a feeling of being European which will contribute to progress towards a real common market and thus improving competitiveness.

This cooperation is even more relevant in the nautical sector since it is a very internationalized market where students / professionals / companies / academia / need to cooperate among others to develop their businesses.

This element has already been demonstrated. As a result of the participation on these networks the University has started important collaborations with other universities (ie, they are supporting universities in Croatia to implement the maritime curricula) and with the industry (clusters). It is proved, that cooperation leads to more cooperation.

Fundació BCN FP experience: Cities network – how cooperation contributes to increase opportunities for learning mobility

Fundació BCN formació professional is part of a network of cities which have been working together for more than 10 years with the main aim to join forces to improve the mobility of VET students / recently graduated.

Each city is responsible to identify companies interested in hosting international trainees during a period of time of 2-3 months. The network has also design a protocol, which is followed by all cities, to welcome and support the students. Each international student has a mentor.

In the framework of this programme, around 130 students/graduates from Barcelona are mobilized each year. In exchange, the city receives around 150 people.

From a comprehensive survey carried out with all students participating in this programme during the 2012-2015 period of time, it was proved that this mobility has a very important impact on the future development of the students.

The initiative is not focussed on the maritime/nautical sector. There is a big potential and of course an area to be explored.

The programme also permits the mobility of teachers and directors who travel to other cities to learn from other's experience and best practices.

This kind of experience contributes not only to create external networks with people from other countries but it also reinforces and promotes the cooperation among local actors who are members/participates in this networks.

MED-MOBILE – networks have to be built on the basis of already existing cooperation initiatives

The experience of the project has proved that networks have to be built on the basis of already existing cooperation initiatives. In fact, the success factor of the project was that there was already a network of Mediterranean Universities (UNIMED) and very well established mobility programmes in the Arabian countries.

Barriers

Vasco da Gama experience: How to guarantee the continuation and follow-up of the initiatives as such?

The Vasco da Gama project is in its closing phase where all participants are drawing conclusions and extracting lessons learnt from the experience. They are also finalising a study identifying main gaps between the offer and demand of maritime education programmes.

Important challenges and barriers identified by the Vasco da Gama are in line with all that have been already said during the focus group, namely the need to progress in harmonising the education and training programmes and certifications, reinforcing cooperation with the maritime clusters and involving the industry in designing the curricula.

However, the main challenge that the project is facing at this moment (and this can be made extensive to other similar cooperation schemes) is to find a way to give continuity and guarantee sustainability of this kind of initiatives.

What they are doing is to identify and launch spin-offs and very concrete projects / initiatives aligned with the UE strategies/funding. They are also working in engaging the private sector. In this sense, MOU between maritime institutions, regional government, and education institution have been signed. They are also working with the UfM.

MED MOBILE and UfM – The challenges increase when the cooperation involves not only European countries but also northern Africa ones

Three main barriers have been identified: the need of VISA requirements for the Arabian students, the lack (or the feeling of lack) of security in some of the Arab countries, difficulties in the recognition systems and languages.

At this point, all participants in the Focus Group agreed that the lack of languages skills (mainly English) difficult enormously the mobility and the cooperation schemes.

Both the UfM encourages all participants to reinforce cooperation with the northern African countries, from which many can be learned on the education and training and the maritime sector.

Barcelona Activa experience – Not sufficient understanding and interest in the maritime sector by the local government

Sometimes the nautical sector is seen as something elitist and not easy to understand for public institutions. Therefore, there are important challenges to raise awareness of the great potential of this industry in terms of creating growth and jobs.

4.1.6 Wrap up and Conclusions

To finalise and conclude the focus group, participants were asked whether it was seen as feasible and with added value to launch/enforcement of a networks between organisations providing education and training in relation to the marine and maritime economic sectors and that would benefit from that cooperation.

The main contributions made by the different stakehodlers are presented below:

- **University**: along the focus group meeting we have been able to identify a number of examples and success stories in terms of cooperation, which are mainly implemented at the local / regional level. The challenge now is to expand and export those very well established cooperation initiatives which have been proved to have a great potential, to the international / European level in order to be capitalised;
- **CRPM**: Many benefits are seen from the experience of cooperating, in this sense they saw an important added value of supporting this kind of initiatives. However, CRPM is clear that what is needed is to strenghten and foster what it is already in place and working, not to try to build cooperation schemes from zero;
- **Port of Barcelona**: as a very active actor in terms of cooperation, the port sees clear benefits of being part of a network;
- **Private sector:** also the private sector agrees with the added value of cooperation. It truly believes that public-private cooperation is fundamental to tackle challenges in this sector and to foster international mobility for the students;
- **MED-MOBILE:** the reinforcement of networks in this field it is also seen by the MED-MOBILE project as beneficial for the society and the economy. However, and based on the experience

gained from the project, they consider that the Mediterranean as a whole it is too broad and extensive and call for support geographical differntiate cooperation initiatives (east, centre and west).

4.2 "The role of education & training networks in filling the supply/demand gap in the maritime sector" - La Valletta, Malta

4.2.1 Context

La Valletta – Malta was suggested as a location for a focus group for a number of reasons. Its central location in the region makes it suitable to act as a potential connector to existing networks in training and education. Educational institutions are member of different kinds of networks: networks of education providers (i.e. the EuroMed Permanent University Forum) as well as project-based networks (Perseus, Seatalk).

The Malta College of Arts, Science and Technology (MCAST) is an important actor and provides VET courses, also for the maritime industry. Recently, Malta's political administrators have publicly recognised a skills mismatch issue, as presented in the National Reform Program 2015. Addressing this issue is part of a wider governmental plan to raise the profile of the island's maritime industry.

The focus group "The role of education & training networks in filling the supply/demand gap in the maritime sector" brought together the key policy makers in the area of the maritime economy, in combination with both public and private providers of education and training, and the industry to discuss:

- How key stakeholders categories (public authorities, private stakeholders and the education & training world) can jointly ensure a coherent link between the provision of education and training and the development of maritime economic activities;
- Potential benefits deriving from maritime education & training cooperation and networks as well as of obstacles and bottlenecks in the development of networks among maritime institutes and organisations in the Mediterranean.

4.2.2 Process leading to the focus group

During the first phase of the study (mapping), Malta was identified as a one of the more advanced countries when it comes to involvement of different types of stakeholders in the maritime and marine sectors. Both the VET-college and the university offer training programmes, and there is a national strategy for raising the profile of the island's maritime industry.

Due to the scale of the island, we expected to find a coherent strategy involving all the relevant stakeholders that would know each other well. The location as a potential hub between EU and Africa was also seen as an interesting feature.

Ecorys made an overview of potential relevant stakeholders to approach. This list was sent to a contact at the Ministry of Transport and Infra, with a recommendation letter from DG MARE. This led to a quick response and the request was forwarded both to the director of the university and the VET-College MCAST. MCAST then quickly appointed Vince Maione, deputy principal of MCAST and responsible for Curriculum, Quality Assurance and Professional Development to help organise the focus group.

The swift organisation and high involvement in the process led to a very efficiently set up focus group, while the high quality of the participants made sure that the group was very involved and dedicated.

4.2.3 Profile of the participants

The participants were a mixture of government representatives, education and public/ private partnerships:

- Government: Two representatives from Transport Malta, two from the Ministry for Transport and Infra. Advisor to the parliamentary Secretary;
- Industry and trade: Ship building, marine supplies, ship repair, commercial and passenger transport, oil tanking;
- Education: the Ministry of Education, the University of Malta;
- Chamber of Commerce, Valletta Gateway Terminal, Malta Maritime Forum, Chartered Institute of Logistics & Transport.

4.2.4 Perspective of training and education providers

Malta has a centuries old maritime tradition. The strategic location of the Maltese Islands at heart of the Mediterranean Sea, its natural harbours, and the entrepreneurial and maritime skills of its people have, since time immemorial, conspired with its history and millennial culture and make it an international maritime service centre. This also clearly came forward in the strong interest for the focus group and the great willingness to participate. In this paragraph we give an overview of some of the topics that were discussed.

MCAST: the current offer is far from what is needed

MCAST was very eager to host the focus group. In the introduction by the director of MCAST, they mentioned some of the issues they face. Being aware that the training they provide for the maritime sector is “just scratching the surface”, the current offer is far from what is needed to keep Malta’s maritime sector in the lead. Nevertheless there is regular contact with the industry, ministries and international exchange of students and knowledge and MCAST fully taps in on all the means they have.

As VET college, they have over 10.000 full and part time students

MCAST provides full-time and part-time evening courses. Full-time students can study for free: they get an allowance from the government. Evening courses are for those already employed, and are mainly funded by companies. These are short courses, with commercial fees. MCAST has courses at EQF level 3 to 6, and will offer 7 in the near future. In total there are 6 000 full-time students and 4 000 part time. MCAST has almost full control of what is being offered. They design, develop and review course offering, and are also certifying. There are 3 colleges: Foundation, Technical and University College.

The College feels strong pressure from industry to do more

MCAST notes that there is a huge pressure from industry to offer more and different courses. There is a need to restructure the courses and to address the needs of the industry. Finding the resources needed is a big issue. Investors are needed. MCAST sees it as its duty to bridge the needs between employers and education.

High costs of maritime training

The cost per student in maritime training is high. More support is needed from the government and Transport Malta. Indeed, the financial aspects of maritime training are certainly important. Attendees stress the need to look at things from an international angle. "We need help, and help is available in international networks and relationships. We should not reinvent the wheel. There are a lot of courses available in other countries: let's cooperate." Even if we use existing courses from elsewhere, there is still a cost associated with that. We need to buy courses from other vendors, it is not free of charge.

The MTC is the Maritime Training Centre. They offer a full range of course, except in tourism. Almost all lecturers are part timers. It is extremely difficult to find a full-time lecturer in this industry. That is one of the major challenges for MCAST. The programmes are 3-year: 1 year at school, one year at sea and then a third year back at school.

Delegates respond by stating that most maritime-related courses are found in the engineering sector. There is a bachelor's degree in marine engineering: they start with a very technical background. There is also an urgent need for courses on port authorities (Malta being the number 1 country for ship registration). Also there is a need to relate to Eastern Med and African countries.

Investing in young people is needed for Malta to not lose its position

Overall the national government should realise that we are loosing our position when we do not invest more in the young generation. One idea would be to build one major institution focusing on marine and maritime training. Ideally this is done in a tripartite construction: government, providers and private companies. The suggestion is made to pool resources, or making an investment fund.

A lot of students want to study engineering, also at University level. It attracts a lot of foreign students as well. Big advantage here is the international accreditation which makes it easier for student to study elsewhere. The University has appointed one representative that is also present in the Malta Maritime Forum. Internally she is responsible for the Knowledge Transfer Office, which calibrates the course with industry.

Very hard to get qualified people from Malta

It is almost impossible to get certified people. We sent them abroad, to the UK primarily. The current students, both from MCAST and Universities, do not get the programmes that are certified. That means that graduates cannot be exempted up to level 5, and thus we are losing people. Even on the deck side, the training does not meet the demands. The IMO does not match normal courses. There should be a mapping with these standards, so that the courses lead to proper qualifications. There are only very few people on this island that are able and willing to do this mapping.

Because there are not enough qualified people, succession planning in business is becoming more and more difficult. Often foreigners are needed to take over.

Transport Malta; "we have a big skills gap!"

Transport Malta: We are here not only for bringing up several issues related to education. We have a problem ourselves. There is an enormous skills gap, and we want to send a very clear message. The inspectorates of Transport Malta (including Ports Authority, Maritime) do not have enough people with the skills needed. We want to act! That means also that we go into secondary schools to explain to students and their parents that careers in Maritime sector are there.

The skills gaps are not typical of our times: there have shortages in the past. We need to invest in education at all levels, not just university. Also at the lowest level, we need people. Niche courses are in demand, not just degrees. And we need to avoid fragmentation.

Lack of sea-going experience

One of the key issues is that our people lack sea-going experience. We need to increase the workforce in these areas. We now have no other option than to source them from overseas. Three ex-students from MCAST didn't apply for a job. The generation have changed: young people seem to prefer office-work. It is also a matter of work ethics, not only maritime skills.

The maritime industry is not perceived as an attractive industry to work for

We are not able to show that we are proud of this industry: we need to make the young generation interested. Malta is an exceptional place, with a long history in the maritime sector.

Skills Council

Malta is currently setting up a Skills Council. For education to be able to align the offerings with the needs of industry, a common language is needed. Occupational standards and job profiling are tools to do this. Attendees say that real needs in terms of learning outcomes needs to be addressed. That has been missing so far.

Opportunities offered by yachting

Another initiative a joint venture between the Government of Malta and the Royal Malta Yacht Club through Projects Malta Ltd called Yachting Malta. It aims to identify and attract to Malta new high profile yachting events including regattas, class sailing, power racing events, boat shows, conferences and other activities related to yachting.

The super yacht industry is potentially very interesting for Malta. Ships that stay here during the winter generate an income of € 1 million in three months period. But the sector requires an entirely different workforce, and there is no training for them available.

The alignment of education and the labour market, what goes well and why?

In the second part of the focus group the participants were divided in into three groups. They were asked to answer the following question: *In the alignment of education and the labour market in Malta, what goes well and why?*

The answers given by the groups were wide and diverse and show a very strong commitment to the subject and great willingness to discuss it amongst each other. In this report an anthology of the answers given is presented.

- The quality of existing collaborations is very high. Malta being a relatively small Island, not very close to mainland Europe makes that it has to fight for itself and working together is a must;
- The accreditations are all in place, on national and international level. On national level there is a National Commission of Higher Education, looking after both public and private education providers, thus ensuring a certain standard;
- These accreditations are very credible overseas. Because of the strong focus on quality there is a large potential for exchange. Within the EU that is largely arranged. For non-EU countries there are still steps to take;
- The certifications are accredited in the whole of the EU and there are many collaborations with other universities;
- Malta has a very long and solid maritime and nautical history;
- There is a free education system that provides full time courses for all;

- The concept of apprenticeship has grown in popularity, one attendee even called it ‘an apprenticeship revival’;
- The level of combined training and education in the industry is perceived to be very good;
- Through collaboration with other organisations in the maritime sector students can get access to other institutions to further their training;
- All stakeholders are very aware that there is a lot of work to be done;
- Through our own institutions students have access to education in other countries: the international cooperation is quite strong.

4.2.5 The alignment of education and the labour market, what can be improved and how?

Next to things that go well already, there are also things to be improved. The groups were asked a second question, namely: *In the alignment of education and the labour market in Malta, what can be improved and how?*

Even though the second question is strongly linked to the first, we deliberately separated the two, thus assuring that good examples got the room they need. In practice that proved more difficult than in theory. A lot can be improved and many attendees have strong views on how to best improve things. This again showed the enormous commitment and willingness to participate, also showing in the answers given. Again, an anthology:

- Maritime education should be pushed at secondary level. The maritime sector used to be included in the secondary school curriculum, thus ensuring an early introduction. Many advocate a return of this so that children are fully aware of what goes on in the maritime sector in present time, not just the information given by parents and caretakers which is often outdated;
- MCAST could benefit from restructuring, it has proven difficult to retain directors for this institute. A clear vision is needed. The current success rate, the amount of dropouts and post graduates are clear signs that thing can be improved;
- The maritime industry is very diverse, which needs to be taken into account when addressing educational needs. But with a population of only 400 000 people, there are limited on what can be offered. Again, a clear vision is needed;
- In general there is a need for more shore-based courses;
- Malta is the largest flag state in the EU and holds the 6th position globally. And they continue to grow as a flag state, maintaining their high standards. Flag registration could well become a Malta specialty, special courses could help;
- A need to improve connections and linkages between ministries at national agenda. Three ministries involved, with at least 2 different agenda’s. DG MARE could help here to push for more national unity;
- With only 400 000 people in Malta, it is impossible to find all the right people. Look at Africa, for example for a school of cadets;
- Industry is very diverse. That needs to be taken into account in education (wide fragmentation of objectives);
- A platform is needed to coordinate. Transport Malta has no focus whatsoever. There is no foundation course for agency clerks: that is what is needed;
- A national information base about the industry is missing. Therefore we lack an overview of vacancies and jobs for the sector.

4.3 "Integrated maritime education opportunities in the area of Maritime Technologies" - Larnaca, Cyprus

4.3.1 Context

Cyprus was suggested as a location for a focus group as it hosts the Maritime Institute of Eastern Mediterranean (Mar.In.E.M.), which already took several initiatives in this domain, notably the launch of Blue Career Days. Recently, the Institute (together with the Maritime Academy of Cyprus) signed a Memorandum of Understanding with the Egypt-based Arab Academy of Science, Technology and Maritime Transport. Cyprus has already demonstrated to have a strategic position in the East Mediterranean region, where room for cooperation is limited due to the instability and political context.

The focus group targeted the subject of "Integrated maritime education and training opportunities in the area of Maritime Technologies". Such technologies are crucial for the development of a wide range of Blue Economy activities, notably shipping, ports development and the energy sector. Currently, the educational and training offer catering towards these professionals and practitioners is still fragmented and much scope for international cooperation exists in this domain.

The focus group was hosted by the Maritime Institute of Eastern Mediterranean, which is "a non-profit organisation, aiming to promote research, technology, innovation, sustainability, education and training within and for the Maritime Industry, and to act as a Forum and a Think-tank but also as an Incubator of Business Opportunities on Maritime Affairs; encouraging and facilitating Dialogue, Networking and Cooperation among the sector's stakeholders in the Eastern Mediterranean Region" (see www.marinem.org).

4.3.2 Process leading to the focus group

During the first phase of the study (mapping), Cyprus and the Mar.In.E.M. were already identified as an important initiative in the region. The team – encouraged by exchanges with DG MARE staff - subsequently approached the Institute which quickly agreed to cooperate and host such a focus group.

A long list of potential participants was then drawn up, starting with the above-mentioned Arab Academy of Science, Technology and Maritime Transport as a key player.

4.3.3 Profile of the participants

The participants were primarily from the maritime education field, focusing on naval engineering, as well as some business and government representatives.

- Education: Two representatives from the University of Cyprus, one representative from the Cyprus Maritime Academy, one representative from the Arab Academy for Science, Technology and Maritime Transport (based in Egypt), one representative from the National Technical University of Athens (Greece), one representative from the Hellenic Postgraduate Merchant Marine Academy (University of Piraeus, Greece), one representative from the Jordan Academy For Maritime Studies, one representative from the AL-Manar University of Tripoli and one representative from the Istanbul Technical University;
- Business, Industry and Trade: One representative from the the Maritime Institute of Eastern Mediterranean (Mar.In.E.M.) which is a Maritime Cluster in Cyprus and Eastern Mediterranean, one representative from the Cyprus Naval Architects & Marine Engineers Association and one representative from the Cyprus Shipping Chamber;

- Government: One representative from the Cypriot Ministry of Education and Culture, one from the Department of Merchant Shipping (Ministry of Transport, Communications and Works of Cyprus).

A full list of participants and a description of the key players that participated in the Larnaca Focus Group and their interests are included in the appendixes.

4.3.4 Validation of findings – qualifications and mismatches

Maritime training is following International standards like STCW

The Standards of Training, Certification & Watchkeeping (STCW 2010) Convention was drafted in 1978. The big change came in 1995 when the US Coast Guard approached the International Maritime Organisation (IMO) and asked them to amend the convention. Significant changes were made to the convention. Each country (administration) is tasked by the IMO to incorporate a statement of compliance with the STCW Code into their Certificate of Competency (CoC; license). Most countries do not have any CoCs that are exempt from STCW 20 and therefore have incorporated their statement of compliance right on the face of the CoC.

A frequent mismatch between training/academic qualifications and practical experience needed by the industry

The perception of the maritime industry is that there is a desperate need for people to go to the sea and gain experience. People need to get the maritime education training, go to sea, stay at sea for a while or longer, gain those skills that are required and then become the officers that will operate and manage the ships for the companies. But it is not only that. Governments need these qualified people to staff their departments, military, coast guard, fisheries departments etc. We are missing these practical skills. There is a global need for officers at the sea. Especially on the technical side we see a lack for university educated marine engineers and naval architects. The main driver is a prospect and a maritime carrier and the future is there. All this is leading to international recruitment and therefore there is a need for networks of naval academies that will train people towards more uniform curricula. This is a global phenomenon and not only to the Mediterranean.

Recognition of diplomas is not important for the industry. The ship industry needs fit for purpose personnel and practical experience is very important and not only the academic qualifications.

Despite international standards, there is still a mismatch between the maritime education offered among East Med Countries

The Bologna process, initiated with the Bologna Declaration (1999) and assessed every 3 years in ministerial conferences, aims to introduce a more comparable, compatible and coherent system for European higher education. Countries subscribing to the European Cultural Convention (1954) are eligible for membership of the EHEA, provided that they declare their intention to incorporate the objectives of the Bologna process into their own higher education system. They should also provide information on how they will implement the principles and objectives.

The Bologna process is in line with the objectives of the EU's education and training framework and its Europe 2020 strategy for growth and jobs. Cyprus, Greece and Turkey are signatories of the Bologna Process but Egypt, Lebanon and Jordan are not[55]. This is one more reason and factor that creates issues of not mutual recognition between degrees and curricula obtained among neighbouring Countries.

[55] See http://www.ehea.info/members.aspx for members of the Bologna process.

Need to improve the courses provided

The IMO's Standards of Training, Certification and Watchkeeping (STCW2010) is considered rather conservative, as it does not include courses on some more recent disciplines (eg electronics) despite the fact that newly-built ships are full of electronics during the past 10-15 years at least. This will only start next year officially (1/2017).

For seafarers, STCW controls the courses offered. However, someone needs to advise the maritime academies of what is needed by the industry and not to limit their courses to the STCW guidelines. So maritime academies could improve their courses in order to provide what the industry needs. Unless you know what the industry needs you cannot prepare and draft your syllabus and studies. This is what is missing here. Not sure if academies know what the shipping industry needs.

Issues with the training and practical experience of seafarers and officers

Ship owners often do not accept cadets for training on their vessels. Many participants argued that most companies do not accept cadets and they do not have the culture to train people. There is a way to make a win-win situation. Ships, shipyards etc. need people with practical experience to do the job.

Table 7.2. List of countries of whom the Certificates of Competency (CoCs) are currently recognised by the Government of the Republic of Cyprus:

1) Argentina	2) Egypt*	3) Ireland	4) Norway	5) South Africa
6) Australia	7) Estonia	8) Israel*	9) Pakistan	10) Spain
11) Bangladesh *	12) Finland	13) Italy	14) Peru	15) Sri Lanka*
16) Belgium	17) France	18) Jamaica	19) Philippines	20) Sweden
21) Brazil	22) Georgia	23) Japan*	24) Poland	25) Turkey
26) Bulgaria	27) Germany	28) Latvia	29) Portugal	30) Ukraine
31) Canada	32) Ghana*	33) Lithuania	34) Republic of Korea	35) United Kingdom
36) Cape Verde*	37) Greece	38) Malta	39) Republic of Montenegro	40) United States
41) Chile	42) Hong Kong	43) Mexico	44) Republic of Serbia	45) Vietnam
46) China	47) Hungary	48) Morocco*	49) Romania	50)
51) Croatia	52) Iceland	53) Myanmar	54) Russian Federation	55)
56) Cuba	57) India	58) Netherlands	59) Singapore	60)
61) Czech	62) Indonesia	63) New Zealand	64) Slovakia	65)
66) Denmark	67) Iran	68) Nigeria*	69) Slovenia	70)
71) * Countries which are in the process of being assessed by European Commission.				

Source: Cypriot Department of Merchant Shipping
http://www.mcw.gov.cy/mcw/dms/dms.nsf/7f35023e46646133c22572fa005207ee/a23e2cf7b6d9d20ac22574b1003bce1a?OpenDocument

Although neighbouring countries such as Lebanon and Jordan are missing from the current list, they are on the IMO White List. The fact that they are not on the Cyprus list is probably due to the fact that there was no need so far for Cyprus to enter into a bilateral recognition agreement with these countries due to the fact that no Lebanese or Jordanian officers serve on Cyprus flag vessels.

Shipping is one of the safest means of transport, yet thousands of accidents still occur each year and the great majority of these involve human error. The main issues which can have an effect on the potential for human error are education and training and working conditions. Therefore, the better the education that seafarers receive, the safer shipping will become.

Although many seafarers operating in EU waters were educated, trained and certified in Europe, it is important to note that EU registered ships are often manned by seafarers who are not nationals of EU Member States. This fact needs to be taken into account when determining the best ways of ensuring that crew members on board EU registered ships are appropriately educated and trained. The EU legislation introduced a specific procedure based on which the assessment of compliance with the requirements of the International Maritime Organisation's STCW Convention (Standards of Training, Certification and Watchkeeping) by non-EU countries is conducted by the European Commission for a wider recognition of their certificates of competency by EU Member States. With the support of EMSA, the European Commission assesses seafarer certification procedures and maritime education and training (MET) establishments in non-EU countries on behalf of EU Member States and in line with the STCW Convention. All assessments take place based on a five year cycle so that, in addition to the occasional evaluation of proposed new countries, each country that has already been recognised at EU level will be inspected on a regular basis. EMSA has also been given the task of verifying the levels of implementation of EU legislation relating to the education, training and certification of seafarers in EU Member States.

4.3.5 Integration of education – a balancing act

Maritime engineers – a call for common standards across maritime sectors

In the second session, the group discussed drivers & barriers for integration and cooperation. How far are we for offering an integrated education? The group participants highlighted the recent developments of international cooperation in the area of hydrocarbon exploitation in offshore facilities in the EEZ of eastern Mediterranean. In this context, participants emphasised the fact that whether working on ships, in ports or on offshore installations, maritime engineers need to address a range of common challenges addressing the rough seas, the corrosive effects of sea water, etc.

Unlike the STCW Convention for maritime transport, no international body or agreement is currently governing the offshore oil and gas sector. The industry is regulated through own training of staff and as this area is closely related to maritime education (steel structures so for example there is a need for welders but also specialised naval architects and other engineers etc) and if other barriers will be lifted, East Med can become an area like the North Sea for the exploitation of the hydrocarbon reserves. So for emergency issues, there will be no strict border controls like nowadays and a better integrated education will be needed towards this direction to create the necessary skills that are emerging now in the region. So there is a need to direct young people to the correct direction in order to have skilled staff for the sector.

As a response, in Cyprus an initiative was taken to organise a Blue Career events aiming to attract young people to the Maritime Sector. This career perspective is particularly important as the sector is particularly strong, not only in Cyprus but in the whole region – which suffers from limited opportunities in manufacturing sectors more broadly.

Participants concluded that there are great opportunities for the maritime sector in East Med for work on the sea. Many people have a degree but no training to work in the sea. For example, biologists do not get any education for safety issues to work on the sea when they embark in a research vessel.

A need for lifelong learning education system: Centres of excellence as a response

It is true that the maritime education is quite diverse in the East Med, and that a full professional life at sea may not be for all. Therefore, it is essential to provide learning opportunities and experiences that can be used both on sea as well as on shore. Currently, people earning a degree obtained after a few years of education (up to 3 years), are not always accepted to continue their studies

later on – and become a University engineer for example. For instance, degrees obtained in the Merchant Marine Academies is not recognised by some universities for further university education and this should be an area of consideration.

Therefore, participants recognised the need for a lifelong learning education system for professional development and a fine balanced choice of opportunities, including e-learning as a tool that can be developed and enhanced jointly to achieve a lifelong learning education system. So combining disciplines in a suitable platform would be a good way forward. However, participants recognised there are limits to integration as it could lead to too shallow programmes if all would be offered in one particular institute only.

As a response, Centres of excellence could pioneer to exchanges and therefore contribute to the integration of education. They would allow for certain levels specialisation – and build complementarities between them.

4.3.6 International cooperation –The alignment of education and the labour market, what goes well and why?

The sea as a unifying element and important stabiliser

In the context of the East Med, the group immediately recognised the benefits from international cooperation. At a strategic level, participants agreed that the creation of economic growth and jobs from the seas can help to stabilise the situation in the region. Therefore, businesses need to be able to grow and young jobseekers need to have prospects. The sea as a unifying element in this fragile reason was recognised by all. A need for concrete initiatives was felt by all as well – and now is the time to act.

In addition, participants agreed to collectively work towards highest possible safety standards and records for sea-farers.

Eastern Mediterranean as the right geographic level to collaborate

In discussions about the geographic scale, participants recognised the fact that maritime affairs are of a global nature and that both education and training providers and businesses need to have such a perspective. Participants from Cyprus acknowledged that their focus had been strongly on Europe in the last decades. All participants felt that a pan-Mediterranean initiative would be too far-fetched due to the large cultural and linguistic differences as well as the large distances within the sea basin. Therefore, participants concluded firmly that any initiative would need to be at the level of the Eastern Mediterranean – and base itself on the long cultural and economic traditions in the region – going back even thousands of years. The commonalities within the region are too easily forgotten by the recent upheavals, tensions and crises.

A recognition of Cyprus as a hub for cooperation

All participants agreed that Cyprus can play a pivotal role in the launch of an Eastern Mediterranean initiative, as it is geographically central – with extremely short distances to all countries concerned. Perhaps more importantly, Cyprus has demonstrated to be very capable in building up and maintaining fruitful collaborative relations with partners both within the EU and outside the EU.

Initiative to establish a Blue Career Centre for the Eastern Mediterranean

Therefore, participants unanimously agreed to take a next step, namely to take the initiative to jointly establish an Integrated Maritime Regional Career Centre for the East Mediterranean or a "Blue Career Centre for the Eastern Mediterranean" to be established in Cyprus – possibly with antenna's in neighbouring countries. The Centre would have the following possible aims:

1) Map and monitor the demand and supply of maritime professionals/seafarers in the region, and make efforts to balance these;
2) Promote the mobility of students and staff within the region;
3) Catalogue the offer of maritime training in the region;
4) Work towards the harmonisation of requirements for maritime professional training, focusing on practice (mostly sea-faring);
5) Promote the sharing and pooling of resources, such as training simulators and a training vessel;
6) Act as a body towards the application of projects (e.g. EU funded projects);
7) Promote the maritime profession towards youngsters

The "Blue Career Centre for the Eastern Mediterranean" although based in Cyprus, it will have branches or representations in the various countries of the region, that among other activities and initiatives, could also undertake to organize as from 2017 an annual regional job-fair for the Blue Economy to be called "The Blue Career Fair of the Eastern Mediterranean". This Blue Career Fair will bring together and allow the interaction of students/graduates and their potential employers in a 3-day "festival" which will include competitions among teams from the various MET institutions, booths for the Academies & Institutions as well as the respective sector Companies-potential Employers /Recruiters. It will also include presentations by potential employers, conferences on relevant subjects, interviews of the job-seekers by potential employers, but also – VERY IMPORTANT - outlets with ethnic food & entertainment (e.g. the Falafel Kiosk, the Donner Kebab Kiosk, the Souvlaki Kiosk, the Lebanese sweets Kiosk etc) as an incentive for the Public to also pass from there with their children thus raising the visibility of and awareness on the blue professions.

Online job fairs could also be organised by the Blue Career Centre in the long term.

It was agreed however that the chances of success of the initiative would be highest by concentrating initially on a few of these aims only – a targeted approach really.

4.4 "Building Skills for Blue Biotechnology and Aquaculture" – Athens, Greece

4.4.1 Context

Building on the above aims, the proposal was to organise a focus group in Athens on **Building Skills for Blue Biotechnology and Aquaculture**, aiming to promote good practices in building interdisciplinary higher education in the area of life sciences, including both biology and pharmacology (needed to address key questions in the sector including animal food and disease prevention). The focus group targeted a broader geographic range and included key stakeholders and experts from countries as diverse as Italy, Croatia, Greece, Cyprus, Egypt and Jordan. Participants from Israel and Turkey also invited but due to last minute unforeseen reasons they could not attend.

The meeting focused on the subject of integrated maritime education opportunities in the area of Blue Biotechnology and Aquaculture in the Central and East Mediterranean. Blue biotechnology of exploration and exploitation of the sea biodiversity in order to develop new products will allow

development of new pharmaceuticals or industrial enzymes and consequently have high economic value. In the long term, it is expected that the sector will offer high-skilled employment and significant downstream opportunities. In parallel, marine aquaculture is a major bio-industry that has achieved a remarkable success in the Mediterranean, especially in the eastern part. The European Aquaculture Technology Platform predicts for 2030 a production growth of more than 100 %, which is equal to a minimum of 4 % per year. Main species will be sea bass, sea bream, sole, meager and turbot whereas it will diversify towards functional additives and bio-energy (algae). Such technologies are crucial for the development of a wide range of Blue Economy activities. Currently, the educational and training offer catering towards these professionals and practitioners is still fragmented and much scope for international cooperation exists in this domain.

The focus group was hosted by the National & Kapodistrian University of Athens, School of Pharmacy (Prof. Vassillos Roussis). Since 1994, the group has focused its activities on the discovery of small molecules –natural products and synthetic derivatives – as lead compounds for pharmaceutical, neutraceutical, cosmeceutical and agrochemical applications. Isolation and structural identification of secondary metabolites with pharmacological activity from marine organisms is a major research area on a postgraduate level[56].

4.4.2 Process leading to the focus group

During the first phase of the study (mapping), aquaculture and blue biotechnology were already identified as important activities developed in the East Med region. Following consultations of the core team with NAYS Ltd, a Greek based project planning and development consultants (subcontractors of MRAG in this study), working actively in blue growth initiatives including aquaculture and marine spatial planning, the team approached the University of Athens (Prof. Vassillos Roussis) and quickly agreed to cooperate and host such a focus group.

A long list of potential participants was then drawn up with academics and practitioners in the area of Blue Biotechnology and Aquaculture, primarily from Greece, Cyprus, Italy, Slovenia as well as Algeria, Egypt, Israel, Jordan, Tunisia and Turkey.

Some reasons for developing the Athens focus group proposal included the following:

a) The focus group would target the important blue biotechnology and aquaculture theme, which is a crucial part of the Blue Growth agenda and an important economic pillar in the region;
b) The underlying life sciences disciplines are not covered by other focus groups, yet they are important and specific to the study theme (e.g. involving post-graduate education);
c) In particular, this field offers important opportunities for interdisciplinary educational initiatives, and much value is expected to be derived from an exchange of practices in this domain;
d) The availability and strong interest from both a host and participants to engage in this exchange;
e) Ability to involve a broader range of non-EU countries in the study, notably Egypt, Jordan, Turkey and Israel;
f) The focus group, whilst being held in Greece, would still involve Adriatic-Ionian key stakeholders from Italy and Croatia, thus securing geographic balance across the region.

The preparatory activities related to the organisation of the Athens focus group was received with great commitment and interest from both key stakeholders and invited participants and thus it is an important prerequisite for any further steps. The focus group was kindly hosted by the National & Kapodistrian University of Athens, School of Pharmacy (Prof. Vassillos Roussis).

[56] (see http://www.pharm.uoa.gr/fileadmin/pharm.uoa.gr/uploads/CV/ROUSSIS_-_CV.pdf)

4.4.3 Profile of the participants

The participants were primarily from the blue biotechnology and aquaculture education field and included representatives from:

- The National & Kapodistrian University of Athens, School of Pharmacy, Greece (hosting organisation);
- The University of Zagreb, Faculty of Pharmacy and Biochemistry, Croatia.; The University of Cyprus -Oceanography Center, Cyprus;
- The Agricultural Research Institute, Cyprus;
- The Suez Canal University Hospital, Suez Canal University, Egypt;
- The WorldFish Centre, Regional Centre for Africa & W/Asia, Abbassa, Abou Hammad, Sharkia, Egypt;
- The Aristotle University of Thessaloniki, Faculty of Sciences, School of Biology, Greece;
- The CNR - Istituto di Chimica Biomolecolare, Napoli, Italy;
- The University of Udine Department of Food Science, Italy;
- The Marine Science Station (MSS) Aqaba, Jordan University, Jordan;
- The Andreas Syggros Hospital in Athens, Greece.

A full list of participants and a description of the key players participated in the Athens Focus Group and their interests are included in the appendixes.

4.4.4 Validation of findings – What are the main drivers of international collaboration?

All participants have a previous experience of international cooperation that initiated either in the framework of an EU-funded or co-funded project or in the framework of bilateral agreements (e.g. Italy – Egypt). Common research interests are an important element to maintain international collaboration even beyond the limited timeframe of a project.

The group identified that although there is cooperation and networks among Mediterranean EU MS, a significant part and prevailing mode of collaboration is with Universities and RTDs with Northern Europe. As for non-EU Countries, the collaboration among them in East Med is not that intense and in most cases, there is collaboration with North Europe (notably UK and Germany) and USA. Non-EU Countries (Egypt, Jordan) collaborate also with the Gulf Countries (KSA, UAE, Qatar etc.) where funding opportunities for cooperation as well as the administration procedures seem to be more attractive compared to the EU procedures.

Aquaculture and Blue Biotechnology: distinct MEAs but with numerous common elements

In the context of Blue Growth, 24 maritime economic activities (MEA) have been identified. Aquaculture falls under MEA No. 2.3 “Marine aquatic products”, which includes “farming of aquatic organisms, mainly for human consumption (mainly fish and molluscs)” and “Blue biotechnology” is MEA No. 2.4 for using wild and farmed aquatic living resources as precursors of bio-molecules used for high value products (health, cosmetics, etc.). It is about unravelling the potential of the biodiversity of a specific earth compartment for the benefit of the rest of the economy.

The group identified that although aquaculture and blue biotechnology seem to be quite distinct activities, aquaculture has an extremely high affinity and benefits from biotechnological improvements and applications ranging from genetics and molecular phylogenetics, to ichthyopathology and health, nutritional bioengineering (enrichment with highly unsaturated fatty acids HUFAs), chemoprophylactics and quality issues.

Developing biotechnological methodologies can be a useful tool for monitoring the quality of the fish and the farming area in order to establish the good organoleptic features, the freshness and quality of a fish, as well as monitoring of dangerous substances for the consumer such as histamine, shellfish toxins or microbial load. The importance of a diet rich in omega fatty-3 acids is now widely known, contributing to major health benefits such as heart health and neurological development.

Food-borne diseases have significant social and financial impacts. Therefore monitoring food safety is very a very important parameter in Aquaculture. Microbial load in food (*Salmonella*, *E. coli*, *Listeria* etc.), constitutes major public health risks and generate emerging disease problems. Monitoring the microbial load of fish with up-to-date techniques such as ELISA or qPCR, can ensure food safety for the consumer. At the same time, research should focus in identification and characterisation of new toxic or microbial threats by supporting research on state-of-the-art tools for reference and surveillance. Monitoring of dangerous substances such as Shellfish toxins in shellfish farming or histamine levels in fish is important for human health. The detection levels are determined by the European Community. Regular controls have to be performed to ensure public health. New methodologies such as HPLC or ELISA are accredited methodologies by international organisms for rapid and accurate quantification of these substances.

Due to the need of species identification in Aquaculture for genetic improvement and it is necessary to have analytical methods for the discrimination between fish species, or even fish populations that might present better characteristics, e.g Specific growth rates, resistance to infections, or Feed Conversion Ratio. Molecular biology methods based on DNA analysis are more sensitive reliable and suitable for the analysis of fish QTL (Quantitative trait locus) or gene expression, those are indispensable tools for genetic improvement.

The marine coastal area of the East Med can contribute to further enhance networks

The participants acknowledged that integrated marine and coastal management could boost “blue growth” opportunities of aquaculture and blue biotechnology. The European aquaculture sector has established the European Aquaculture Technology and Innovation Platform (EATiP) that in its vision document (2014[57]) highlight among the challenges to be faced in the Mediterranean Aquaculture the effective marine & coastal spatial planning. In the past decade, the aquaculture sector remained relatively stagnant in the EU when it was one of the fastest growing food sectors in the world. This situation is a paradox as the EU is the world largest seafood consumer and is obliged to import 70% of the seafood sold in its market. Therefore, a short term and long term action plan should include access to new production sites, licences, diversify species profile, simplification of legislation, incorporation of biotechnological developments, assure environmental sustainability, encourage diversification and integration and last but not least, proceed to integrated spatial planning for aquaculture development. This will boost the need for human resources to staff the future aquaculture industry and related ancillary sectors of the blue and green economy.

East Med has competitive advantages for aquaculture development

The Eastern Mediterranean has competitive advantages compared to Western Mediterranean for developing aquaculture. Not only it has a higher temperature of 1,83 degrees Celsius as an average, but also has numerous bays, gulfs and islands that offer a competitive geophysical advantage for this activity. The ideal geographical conditions offer numerous islands and small bays with deep waters in proximity to land-based facilities. That is the reason that Greece and Turkey are the largest producers of sea bass and sea bream in Europe and worldwide. Beyond this fact, Egypt is the 9th largest producer in the world, with more than 1 million tonnes production of which not a

[57] See: http://www.eatip.eu/default.asp?SHORTCUT=92

single kilogram of fish comes from the sea! Therefore, the potential of Egypt for aquaculture development is huge, as it has not only coasts in the Mediterranean Sea but also in the Red Sea.
This competitive advantage of the East Med for aquaculture development must be further strengthened with enhanced networks among East Med Universities and RTD Institutions and further exchange of young students and scientists to facilitate understanding and a better knowledge of the East Med ecosystems and carrying capacity. In the past, networks developed to boost and strengthen aquaculture in the Mediterranean. However, nowadays, the industry is more mature and there is a big number of knowledge producing institutions in the East Med in this field. So a lot of know-how tailor-made to Mediterranean conditions has been created and this knowledge and improvement as well as best practises can easily be shared among East Med Institutions. Joined courses could be a first step to realise this aim.

The vast potential for blue biotechnology and aquaculture development in saltworks and coastal lagoons

The Mediterranean region hosts around 400 coastal lagoons, covering a surface of over 641 000 ha (6 410 km^2) – almost like the island of Crete - with differing in both their typology and use. Fisheries and various forms of aquaculture have been traditionally carried out in Mediterranean coastal lagoons since ancient times and are part of the cultural heritage of the region ("valicoltura" in Italy). In addition, often adjacent to these lagoons exist solar saltworks, also known as 'salinas' or 'salterns', are either natural or manmade systems where a wide salinity gradient is maintained along a series of interconnected ponds for the extraction of salt from sea water by means of solar evaporation. They are also coastal aquatic ecosystems of considerable heterogeneity, as they combine a spectrum of environmental types along the salinity gradient, starting with the lagoonal environment of the initial few evaporation ponds and ending in the harsh, extremely hypersaline environment of the crystallizers. This physico-chemical diversity is reflected in the diverse flora and fauna that is adapted to and colonizes each environmental type in the saltworks system. In saltworks and inland desert and arid zones (abundant in Egypt, Israel, Lebanon and Jordan) a variety of biotechnological applications can be implemented[58].

Bioactive compounds from extremophiles and nutraceutical application

Halophytes, extremophile perennial plants growing along salt marshes, salt lakes and salt works all over the world, have strong antioxidant properties due to the production of secondary metabolites, produced to counteract environmental stressors, represented by variations of salinity, temperature, soil composition. Among secondary metabolites, phytosterols and phenolic compounds, mainly flavonoids and phenolic acids, are particularly abundant. These compounds are responsible of the strong antioxidant activity. Due to these properties, halophytes are considered a promising source of functional foods, pharmaceuticals and cosmetics.

Bioactive compounds from extremophiles and pharmaceutical application

Microorganisms that survive in extreme ecological conditions, such as high temperatures, high salt concentrations or extreme pH levels, have developed unique physiological and biochemical characteristics that make them a potentially valuable resource in the development of new biotechnological processes and industrial applications such as new products pharmaceuticals, cosmetics, nutritional supplements, molecular probes, and enzymes. Halophilic archaea living in high salinity basins of salt works produce high levels of carotenoids (bacterioruberin), in response to high light intensities. These molecules exert many functions within the bacterial cells, protecting organisms from excessive irradiance and allowing the use of light as source energy. Carotenoids, lipid-soluble antioxidants, responsible for the yellow and red colours in many vegetables, have been

[58] See: http://eusalt.com/sites/www.eusalt.com/files/newsletters/Proceedings%20of%20the%202014%20EuSalt%20Solar%20Salt%20Conference.pdf

shown in humans to prevent many types of cancer and cardiovascular diseases related to oxidative stress, thus these compounds have a considerable potential for use in pharmacology.

In Israel Algatechnologies, or Algatech, a research-based biotechnology company that cultivates and grows algae. The company, recently bought by a UK firm, has developed a way to mass-produce microalgae in Israel's hot Negev desert. Its premiere product is astaxanthin, a powerful and natural antioxidant for human consumption.

From the biochemical point of view, antioxidants act preventing or scavenging free radicals, thus the interest in natural sources containing these chemical compounds is increasing. Natural antioxidants, such as phytochemicals have the ability to modulate many signalling pathways, they interact with growth factor receptors, influencing cell survival, cellular signalling cascades, and modulating cell cycle regulatory molecules, leading to inhibition of growth and/or apoptotic death of tumour cells.

Bioactive compounds from extremophiles and cosmeceutical application

Cosmeceutics seem to be one of the most promising industrial applications of halophilic bacteria. Its remarkable economical potential is confirmed by the great success of the ectoine, a compatible solute produced by moderately halophilic bacteria. Extremophile organisms have a high biodiversity due to the extreme conditions of the habitat in which they live causing them to produce bioactive molecules (such as carotenoids and polyphenols). These compounds can act as inhibitors against these metabolic patterns inducing photoaging and protect against the ultraviolet radiation. Experimental evidence confirmed the importance of natural antioxidants from marine organisms or extremophiles in preventing processes related to photoaging. This reduces the occurrence (in a dose dependent manner) of factors promoting skin damage.

Summarising, the group highlighted the huge potential of the marine coastal area of East Med, that includes special habitats of coastal lagoons and saltworks, can create jobs in the near future in the MEAs of aquaculture and biotechnology.

4.4.5 What are the main barriers of international collaboration?

In this session, the group discussed barriers for integration and cooperation. The group reported a number of barriers for international collaboration. Apart from the political issues, which are intense in the region, academia and Industry are ready for cooperation that to some extent is materialised with the common participation in projects or investments from one country to another. For example, the two major aquaculture companies of Greece have expanded their activities to Turkey by buying out Turkish companies and by operating in both sides of the Aegean Sea.

Important barriers reported from non EU participants include the following:

- EU grants and projects are very competitive and complicated for non-EU partners and often they do not fit well. This drives most of the universities to look into other Arab funding opportunities from the Gulf Countries and orient themselves towards them and towards USA based projects;
- For non-EU partners it is hard to do big projects because they do not have the infrastructure, so if they want to do a big project a lot of money is spent just on infrastructure alone (50 %);
- The institutions in the Mediterranean are not well known to non EU Countries, especially when compared to the USA and UK. So a large number of exchanges is directed to these countries;
- Research has to be more practical and aimed at solving actual problems, instead of just researching what the call says;

- There is a general feeling that calls are not developed through a bottom-up approach. So funding should allow people to come with problems and try to convince the EC to give funding for research to solve them;
- Even though there are possibilities for non-EU countries to participate in EU research and projects, often there is a difficulty to access this information.

Some solutions could include:

- A specialised Centre for non-EU participants that could act as a Support Unit (facilitator) and assist in the proposal submission;
- Try to include the Gulf States in the eligibility of the actions. They have the funds and are willing to collaborate. The participants expressed fears that it might be hard for Saudi Arabia to collaborate with the EU;
- There is a need for more publicity and wider dissemination of the EU funded opportunities. An information day or a conference could greatly help the notoriety of blue biotech and aquaculture in the MED.

Other barriers identified by the focus group participants were:

- Lack of collaboration culture between industry and research. We should find a way to connect research with industry and *vice versa*. Perhaps a platform for aquaculture and biotechnology could contribute to achieve this. Participants agreed that there is a need to strengthen links between industry and academia. So a platform that companies could source adequate people in the academia to solve their problems, could certainly contribute to provide solutions;
- Smaller countries like Cyprus lack a real marine research centre. Cyprus could lead and participate in networks for research on alien species and Lessepsian migration (the on-going migration of marine species across the Suez Canal, usually from the Red Sea to the Mediterranean Sea, more rarely in the opposite direction);
- R&D is still not a stable factor in the industry and is the first thing that is reduced when business does not do that well for a while. This has to change in order to build a stable collaboration between academia and industry.

When thinking of networks, funding is often considered to provide the initial spark. But we may need to think beyond that – and look at what is required by focusing on problems. Looking at incentives and expertise first, and only then look for funding.

Availability of funds is often the main problem – but it is certainly not the only one. Accessing the right people, at the right countries at the right time. By using a strategy to pool resources and have access to the resources. Networks and exchanges will allow people to see trends in the various laboratories, where they are heading. This creates ideas and best practices and can result in a useful transfer of best practises when back home.

4.4.6 International cooperation – the way forward

During the meeting, several ideas emerged regarding the employment of (post) graduates. How can we assure better employment opportunities for graduates and do networks assist in that?

These ideas include:

- Creation of international course on blue aquaculture & biotechnology;
- Create a network for management/exploitation of coastal hypersaline ecosystems;
- International training network to train people on proper management of special ecosystems that will include training in molecular approaches, proper use of biotechnology tools towards biomonitoring, quality assessment etc, setting the criteria for quality assessment, use of

biotechnological tools (hatching characteristics, designing of genetic/molecular markers, molecular techniques, use of bioinformatics);

- Focal points to support submission of EU proposals (for the non-EU Member States).

Joint forces and establish a Blue Biotechnology & Aquaculture postgraduate course for the Central-East Mediterranean

Following consultations with the participants it was agreed to join forces and establish a Joint Blue Biotechnology & Aquaculture postgraduate course for the Central-East Mediterranean. This is perhaps a first step to put wind in the sales of Blue growth in the East Med region.

The global aim of the Joint Blue Biotechnology & Aquaculture postgraduate course is to contribute to the creation of an interdisciplinary flexible programme that will allow the graduates to have a very good understanding of the marine biotechnological opportunities especially in the area of the Central-East Mediterranean.

Institutions from Croatia, Cyprus, Egypt, Greece, Italy and Jordan but also from Israel, Slovenia, Turkey and Lebanon can join forces and create a joint flexible postgraduate course that will offer educational, training and exchange possibilities among the participating institutions. The postgraduate courses can be organised into:

4) A joint Master of Science programme;
5) Summer schools;
6) Distance Learning (Lifelong education) opportunities.

The implementation of the joint Blue Bio & Aqua Postgraduate Course programme will be performed by instructors members of the Aristotle University of Thessaloniki (AUTh, Greece), the National & Kapodistrian University of Athens (NKUA, Greece), the University of Cyprus (Oceanography Center), the University of Zagreb (Croatia), the University of Udine (UNIUD, Italy), the University of Jordan (Marine Science Station, Aqaba, Jordan), researchers from accredited domestic or foreign foundations (CNR- Institute of Biomolecular Chemistry, Italy; The Agricultural Research Institute in Cyprus), holders of doctoral diplomas with adequate scientific or authoring or research activity in the discipline of the M.Sc. programme, invited professors of other Departments of domestic or accredited foreign Universities, as well as other categories of teaching staff. The existing facilities of the above Knowledge Producing Institutions (Universities, Technological & Research Institutions) will be used for the operation of the joint postgraduate courses. The selected candidates will pay some tuition fees and this will safeguard the sustainability through time.

The joint Blue Bio & Aqua Postgraduate Course program will aim to:

6) Bridge the gap between EU and non-EU countries in the East Med area;
7) Bridge the gap between academia and industry. The joint Blue Bio & Aqua Postgraduate Course will act as the bridge between the Knowledge Producing Institutions (KPI) and the Industry and thus by adopting suitable courses, more suitable and well-fit graduates that can be absorbed by the regional Industry will be more fit for purpose;
8) Facilitate young people to get a job in the biotechnology and aquaculture sector by acting as a carrier centre and by promoting the best talents through rewarding excellence;
9) Facilitating young people to make theses on real industry– led problems and issues, thus facilitating the interaction between KPI and the industry;
10) Promote and enhance the knowledge of existing employees in order to increase their capacity and knowledge and strengthen their employment positions, through e-learning.

4.5 "Exploring Education and Training Cooperation Opportunities in the area of navigation safety, security and the protection of the marine environment" – Genoa, Italy

4.5.1 Context

Genoa was suggested as a location for a focus group focusing on maritime security and safety in relation to education and training. The city of Genoa hosts several institutions who play a key role in the development of the maritime sector in the region, while being particularly active in cooperation activities as well as in the provision of training. Moreover, its prestigious maritime legacy as well as strategic connection to several major maritime locations in the Mediterranean sea made the Ligurian capital an ideal meeting location for exploring cooperation potential among maritime stakeholders.

The focus group targeted the subject of international cooperation in the areas of maritime education and training in the Mediterranean sea basin. Specific attention has been given to three specific sectors: maritime security, maritime safety and the protection of the marine environment. While security and safety issues were central in the exchanges, the protection of the environment has been only briefly mentioned.

These sectors are of the highest importance in ensuring the safe use of the sea and in securing maritime borders. The improvement and optimisation of maritime surveillance activities, including their interoperability at the international level, are of crucial importance to meeting the challenges and threats relating to safety of navigation, marine pollution, law enforcement and overall security.

The focus group was hosted by the Genoa Coastguard Training Centre "C.A. Antonio De Rubertis", which plays a pivotal role in ensuring ad hoc training notably in the areas of safety of navigation and maritime transport.

4.5.2 Process leading to the focus group

During the first phase of the study (mapping), the University of Genoa was identified as provider of several maritime-related academic courses. The Italian athenaeum is also member of international cooperation networks such as the 'Marco Polo' programme and 'Trainmos'. Moreover the project team approached the Italian Coastguard located in Genoa which quickly agreed to cooperate and host such a focus group.

A long list of potential participants was then drawn up, starting with key players located in Genoa, and extending to several non-EU stakeholders.

4.5.3 Profile of the participants

Next to the two members of the Ecorys project team, 9 participants from 4 different countries attended the meeting. They represented prestigious maritime education participants and training institutions which, in their home country or through various types of cooperation, play important roles at the national and international levels:

- The Genoa Coastguard Training Centre;
- The International Maritime Safety, Security and Environment Academy (IMSSEA);
- The University of Genoa
- The Mediterranean Institute of Maritime Training (IMFMM) in Tunisia;
- The Tunisian Naval Academy;
- The University of Tangier, Morocco;

- The Holy University of Kaslik, Lebanon.

4.5.4 Validation of findings – qualifications and mismatches

The cross-cutting nature of security and safety

One of the first elements which emerged during the exchanges was the a-typical nature of maritime security and safety: according to participants, almost every Maritime Economic Activity has a security-safety component. Undoubtedly, the cross-cutting nature of security and safety contributes to the idea that tackling security and safety issues in a comprehensive and coherent manner is somewhat difficult. For instance, security as well as protection of the marine environment have an undeniable cross-border component. Yet, what participants indicated as missing is the widespread awareness of the centrality of security and safety in the maritime field. With the exception of maritime transport, maritime industries pay too little attention to security and safety aspects. Awareness on environment protection is better spread, although it often suffers from scarce financing. “Safety first” should become one of the underlying principles of the maritime economy in the Mediterranean sea basin and beyond. In this sense, a central topic such as working conditions of personnel should be viewed in the broader context of safety.

Education and training: a mixed picture of competencies and key actors

National differences and specificities dominate education and training in maritime security and safety. As highlighted in the Background Paper, the responsibility for the provision of education and training in security and safety can vary greatly depending on the country. It can be provided by public or private organisations, being more focused on higher education or, conversely, focusing on vocational education and training. In Italy, training of seafarers is only partially covered by the Coast Guard, since part of training is delivered by accredited private organisations.

In turn, Tunisian merchant and navy officers are trained in the same facilities: some courses are common to the two professions, while others reflect their relative specificities. As for Morocco, education and training responsibilities (including in the security and safety areas) are distributed along the competencies of the different national institutions and actors, which independently provide courses and certificates depending on the sector, thus autonomously developing competencies that are not necessarily recognised in or transferrable to other maritime areas. Because of such division of competencies, universities in Morocco are sometimes criticised for not being able to respond to the real needs of the maritime industry in terms of competencies development and skills provision. Another element which emerged from the exchanges was the diversity in terms of ‘size’ of relevant actors: education and training is provided by both large and small players, from universities to public entities until small private organisations. All these elements of complexity should therefore be taken into due consideration when considering cooperation dynamics as well as effective frameworks of cooperation in the areas of security and safety.

Involvement of the private sector can be beneficial

Industry representatives often believe that education and training providers are not fast enough in following up with the real needs of the industry. However, what should not be underestimated are the costs linked to the development, conceptualization and implementation of courses and trainings. Most of the time, it is up to the education & training institutes as well as to public authorities to cover the costs. Hence a mismatch emerged between both the perception of what it really entails to provide education and training as well as on which actors could play a relevant role.

Starting from the above argument, participants referred to the importance of including the private sector in the process leading to the development of competencies for maritime security and safety. It is however of crucial importance to ensure that the development of competencies responds to the

general interest and not to ad-hoc, selected interests. In fact, protection of the environment, safety of navigation, protection of seafarers are to be considered as public interests. In this sense, public authorities need to accompany such processes, also by bringing a more forward-looking perspective to the process. Concrete forms of cooperation with the industry can include trainings in private companies as part of the overall education and training phase. Moreover, the private sector can contribute to funding individual courses or sharing practical and professional expertise. In Lebanon CMA-CGM (the world's third largest container shipping Group) and the American University of Technology of Lebanon signed in 2009 a memorandum of understanding to launch an undergraduate program specialised in Transport and Logistics Management. As a result, CMA-CGM benefits from highly qualified students with large knowledge in the field, while students have higher chances of being employed thanks to their matching skills.

4.5.5 Opportunities and challenges

Willingness and concrete ideas for promoting international cooperation – but start with bilateral cooperation

In the second part of the focus group participants discussed drivers and barriers for cooperation. It became clear that the differences in how countries organise and distribute competencies and responsibilities call for innovative cooperation solutions. Cooperation is key to collectively tackle issues like protection of the environment as well as security, because their effects naturally go beyond national borders and should be hence dealt at regional or international level. According to participants, bilateral agreements are the most frequent form of cooperation when Mediterranean countries deal with such issues. It seems that, at times, even cooperation within one country can be arduous, because of different levels of knowledge and expertise among actors.

At Mediterranean level, participants recognise the potential for international cooperation, notably in the form of collaborations where resources and expertise can be pulled together to benefit participants. It became apparent that no multilateral platform for sharing maritime education and training needs actually exists. In this context, the concrete example presented by IMSSEA provided an opportunity for exchanging on a concrete cooperation method such as 'training the trainers'. Under the auspices of the International Maritime Organisation (IMO), IMSSEA delivers courses for selected maritime officials with the aim to support capacity building activities for IMO member countries. Most of its attendants come from developing countries and once back home will in turn train colleagues, thus contributing to sharing relevant maritime knowledge.

A few barriers need to be tackled

As course costs are covered by participants, the principle of 'training the trainers' is an efficient way to ensure the sharing of knowledge and development of competencies, at low cost. Besides the advantages, this system of knowledge sharing also comes with certain needs and risks: on the one side, investments need to be made firstly to make sure that those professionals who will train other officials have the skills to so and are given the opportunity to be trained themselves. On the other side, and similarly to what happens with 'Chinese whispers', part of the knowledge shared from one trainer to another can be lost or diverge from its initial content. Moreover, the issue of certification was mentioned as a potential hinder to cooperation. Qualification of trainers should be issued in accordance with the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW convention). However, this type of qualification comes with costs that not all countries or organisations can bear.

An additional concrete domain in which cooperation can occur is the pooling of resources, such as in the case of trainings with simulators. However, training needs might differ considerably even within one country when it comes to rules and references between, for instance, simulators used by

seafarers and navy personnel. Another challenge arises from the differences between national training and education frameworks. This being said, to cooperate does not necessarily mean to replicate national specificities. On the contrary, national differences should not refrain interested countries and stakeholders from coming together and sharing experiences.

4.5.6 Achieving potential – Ideas for a Mediterranean Maritime Education and Training Forum

All participants agreed that the Mediterranean region is the appropriate level where international cooperation could occur. When asked about the framework such cooperation could use, participants suggested that of a "Mediterranean Forum for Maritime Education and Training". According to them, the flexibility that such type of structure provides is key to ensure the participation of different countries and stakeholders, therefore allowing to go beyond the complexity of national education and training systems in the maritime area. The forum would not exclude any actor on the basis of their competence or national characteristics. Instead, it would serve as a platform where different stakeholders meet and discuss to collectively identify common education and training needs, as well as efficient and effective solutions. Membership would therefore be open to public and private education and training institutions, policy makers, the maritime industry as well as existing networks of cooperation which have a maritime education and training focus or component.

Concretely, the forum could organise periodical meetings, each of them bringing together different sector representatives from the public, private and education & training spheres. For instance, all those interested in maritime security could meet every 6 months to discuss education and training needs. The most important element would be the solution-oriented nature of such gatherings: participating organisations and institutions would propose collective solutions to address such needs, but also volunteer to provide teaching material, staff or meeting facilities.

Because of its voluntary nature, the forum would differ considerably from existing schemes. The NMIOTC - NATO Maritime Interdiction Operational Training Centre[59] in Crete is open to naval academies only. Also the European Coast Guard Functions Academy Network[60] is based on selected membership (European Coast Guards or equivalent), while being co-financed by the European Union.

Instead, the forum would be open and flexible to maximise participation opportunities and mirror the variety of actors and interests. In terms of membership fees, participants suggested that the related costs would remain limited and in any case covered by the single participating organisations. When evoking the possible role for the European Commission, participants suggested that a platform for coordination or a 'secretariat' structure could be made available. This would benefit the forum in terms of connecting people to facilitate exchanges, organise the logistics of the periodical meetings as well as making sure that training and education ideas that emerge during the exchanges can find the necessary technical, content and logistical support.

[59] http://www.nmiotc.nato.int/
[60] http://www.ecgff.eu/

Annex 8: Case Studies

4.6 VET On Board – 'Maritimisation' of the nautical training offer in Barcelona

4.6.1 Introduction and objectives

"The role of clusters to promote synergies in the maritime education and training offer" was the title of the Barcelona focus group, which was organised on 23th November 2015 in cooperation with the Barcelona Cluster Nautic, a body which brings together various organisations from the private sector and which works intensively with regional universities and the public authorities at local level. Maritime Economic Activities (MEAs) tackled by the cluster, and also covered during the focus group, are mainly related to leisure, working and living, in particular, to cruise shipping and coastal tourism.

Among its lines of actions, the cluster is actively pursuing initiatives in the area of training and education, as a central element to promote the development of the sector. In fact, one of the Barcelona Cluster Nautic's goals is to promote specialisation and excellence in nautical related maritime activities' training. The Cluster is working in close cooperation with other key stakeholders to adapt training supply to the needs of the sector bearing in mind that knowledge and human capital are essential aspects for creating value and contributing to economic growth in this field.

The focus group focused on the role of clusters to promote synergies in the maritime education and training offer. It succeeded to bring together actors from the education sector, the industry and decision makers at international, regional and local level covering the entire spectrum of institutions responsible for designing and providing the maritime education and training offer. In particular, the session counted with the participation of representatives from the education institutions (both higher and VET education) in the maritime field, representatives from the business, industry and trade sector, namely, the Barcelona Cluster Nautic itself, the Chamber of Commerce of Barcelona and two representative companies and also the regional and local government. The event was enriched with the assistance of leading international organisations in the Mediterranean such as the Union for Mediterranean, the Intermediterranean commission of the CRPM and an ENPI project led by the Chamber of Commerce of Seville devoted to support and foster exchanges initiatives of student in the Mediterranean countries.

In the framework of the focus group it was discussed how different key stakeholder categories (public authorities, private stakeholders and the education and training community) could jointly ensure a coherent link between the provision of education and training and the development of maritime economic activities, notably tourism-related activities. In other words, how the different actors and stakeholders can organise themselves and set up a collaborative framework in order to better comply with a new sector that is bringing more and more job opportunities in Barcelona's metropolitan area, and that has to do with the growing flow of big boats and cruise shipping coming to the port of Barcelona.

4.6.2 Context situation

Maritime sector: an asset for the city of Barcelona[61]

Barcelona is the capital city of the of the Catalonia region in Spain. With a population of 1,6 million within its administrative limits, it is the second most populated city in Spain. Its urban area is, with a population of around 4,7 million people, the seventh-most populous urban area in the European Union. Being the largest metropolis on the Mediterranean Sea, Barcelona´s relationship with the sea has influenced its socio-economic growth and urban transformation, with changing values and uses and creating strong links between the city and its coast. Through its ports, commerce, fishing activity and coastal tourism Barcelona has started to use the seas as one of the most important economic and social pillars of the city.

The coast of Barcelona, stretching for more than 100 kilometers, has 24 ports developing a whole range of services related with nautical activities. Some of the most important nautical ports in the Barcelona's area of influence are the Port Vell (with three sports harbors and capacity for super yachts), the Port Olimpic (with 740 mooring for vessels 7-30 metres), the Port Fòrum (with capacity for 201 vessels), the Port of Mataró (with 4.000 moorings) and the Port of Vilanova i la Geltrú. The city has also positioned itself as one of the most important hubs at international level for cruises to the Mediterranean, Latin America, Caribbean and Bahamas.

Another important aspect to be taken into account is the quite unique infrastructure and strategic position of the city to accommodate super yachts and vessels which undertake voyages between the Mediterranean and the Caribbean. The presence of one of the most prestigious, world-class repair and refit shipyards for super yachts represents also a key asset in the nautical sector.

The great importance of this sector as a fundamental economic engine is also observed at regional level. The Catalan coast stretches for more than 780 kilometers and hosts 1.175 companies related to the nautical sector, of which almost 70% are located in the province of Barcelona. The number of moorings in the region has increased in the last two decades and now amounts to more than 30,000. In monetary terms, the nautical sector in Catalonia generates an economic impact of 84 million Euros each year and 996 direct jobs. This sector's estimated indirect impact is estimated at 9,000 jobs, generating annually almost 400 million Euros.

Taking into account all these facts, there is no doubt that the nautical sector represents an important asset for Barcelona, not only in terms of social impact but in terms of wealthy and job creation. The importance of the sea, and particularly the nautical sector, is therefore a defining element of Barcelona, its industry, economic and commercial activities as well as its social and cultural environment.

The education sector in Barcelona

With more than 90 VET schools, teaching 150 different specialties from 23 professional families and eight higher university centers, the training and educational offer in Barcelona is very well consolidated and offers a high number of degrees in a wide spectrum of knowledge fields. The city also stands out by the high number of Erasmus+ students received as well as for its business schools offer which includes a number of institutions ranked in leading position both at European and international level.

In terms of specific centers dedicated to the nautical and maritime sector in the city, Barcelona hosts two universities: the Barcelona nautical faculty of the Polytechnic University of Catalonia which offers education degrees in the areas of marine engineering and marine civil (nautical and

[61] Barcelona Cluster Natuic: http://www.barcelonaclusternautic.cat/en/sector_in_barcelona

maritime transport and marine technologies) and the Tecnocampus Mataró which has developed a Degree in Logistics and Maritime Business.

As far as the VET level is concerned, it is important to highlight a new initiative recently launched: the Nautical institute of Barcelona *(Institut nàutic de Barcelona)*, a newly established (2015) integrated professional training institute specialising exclusively in the field of sports and maritime recreational studies. It offers initial professional training in maintenance of boats and recreational sports (dual mode) and sports education (lifeguard, sailing and diving). It is a public organisation created through an agreement between the Education Consortium of Barcelona, the Department of Education of the regional government and the Far Consortium. It was created from the merger of all the nautical institutes and schools of the city with the aim to train and qualify professionals of the sea, with technical skills and attitudes required for the field of sports and recreation. Its location in the Port of Barcelona facilities contributes to reinforce the establishment of links with businesses and organisations nautical sector, promote a close relationship with the professional sports world and to have a key role in the revitalisation and competitiveness of the Port of Barcelona.

Outside the strict scope of the city, there are also a number of VET centers teaching nautical studies. The province of Tarragona counts one of them (Fishing and nautical school of Catalonia (Escola de capacitació náutico pesquera de Catalunya) offering degrees in maintenance and control of the machinery of ships and boats and maintenance of recreational boats and the province of Girona has a second one, the Instituto de Educación Secundaria (IES) Serrallanga with diving and sailing related VET degrees.

4.6.3 The challenge

The context provided above clearly demonstrates the importance, added value and potential of growth of the nautical sector for the city of Barcelona. However, if the city wants to maintain its leadership position in this field, guarantee the growth rates and make the most of this sector potential development, it needs to make sure that the right framework is in place. Among all the elements required for this sector to perform and increase its competitiveness, the training and VET programmes play a fundamental role in being the education level capable to provide the students, and futures professionals, with the qualified technical skills needed by the industry.

Bearing this in mind Port 2000 and the Barcelona Foundation for VET, the VET on Board Programme identified two important challenges in this field:

- Firstly, they recognised an important lack of knowledge coming from the private companies of the city, many of them being foreign companies, about the VET system and programmes offered in the city. The companies were not familiar with the functioning of the VET programmes and were not aware that many of the profiles required could be found in VET centres;
- Secondly, and when comparing the big numbers and growth potential of the nautical sector and the limited number of specific maritime-related educational and training centres, the main stakeholders operating in the sector pointed out a mismatch between the demand (both current and future) of skilled professionals and the offer of specialised training offer. The challenge was to make the companies understand that the profiles they were requiring do not need to have a purely maritime training background, but, on the contrary, the city counted with very well trained students in other relevant domains, who, with the right specialisation could be valid and very well prepared to work in the maritime industry. This idea can be denominated as a sort of “maritimisation”, referring to this concept as making a training offer more maritime-focused. In this case, making a VET curricula and the students become closer to the sea and their specific particularities.

As a consequence of these two elements, the companies were not able to find in the city those well- trained professionals with the required right skills. As a result, job employment opportunities in this sector which shows high added value and high remuneration careers, were untapped.

This gap between the offer and demand of professional profiles is even more severe in the case of the luxury and top yachting industry. This industry and this typology of clients request excellent performance and high level job profiles that are not available at present in the region neither offered by the training centres. As a result, the local professionals do not have the skills to compete with foreigners in high profile jobs, required by the industry, meaning that the companies need to find and recruit this qualified staff in foreign countries.

Although a large potential growth of the sector is observed, this growth will be conditioned, among other elements, by the existence of an adequate work force that will bring excellence standards to the newly created services and products in the nautical and leisure sector. In other words, if the city wants to create the right conditions for the sector to growth and wants to make the most of it, it is crucial to address the mismatch between the offer and demand of professional profiles providing the right job profiles to meet the requirements of the very high demanding nautical industry.

This could only be done with an active involvement of all the community, the public sector, the private companies and the education community to jointly design, develop and implement new VET programmes (or adapting already existing ones) capable to meet the market needs and requirements.

4.6.4 The VET on Board programme

In this context, and to address the identified challenge described in the previous section, the public institutions, the private companies and the education community began to work together to design the so-called *VET on Board Programme,* an initiative to strengthen the link between vocational training and the companies from Barcelona's nautical sector with the final aim of contributing to develop a training system able to meet the needs of the nautical sector.

To this end, the Barcelona Foundation of VET (hereafter, the Foundation) was established in 2012 through a partnership agreement with the Marina Barcelona 92 (hereafter MB'92) to launch the VET on Board Programme and thus to promote the training and specialisation of VET students from Barcelona within the nautical sector.

This agreement was strengthened through the signature in 2014 of a cooperation agreement between the Foundation and the Barcelona Cluster Nautic from which the Programme was extended to all the companies and organisations associated to the Nautical Cluster. Thanks to this agreement the cluster's companies were able to host or request students enrolled in vocational training centres in Barcelona to take part in practical training placements. It also represented a qualitative leap for the programme in the sense that the number of companies involved in the initiative was increased providing a greater number of options to the students.

The agreement between those two organisations also envisaged the creation of a job search engine aimed at graduates of vocational training. Barcelona Activa, the agency responsible for promoting the economic development of the city, is also involved in the initiative by providing technical English lessons to the participant students.

Table 8.1: Stakeholders involved in the VET on Board Programme

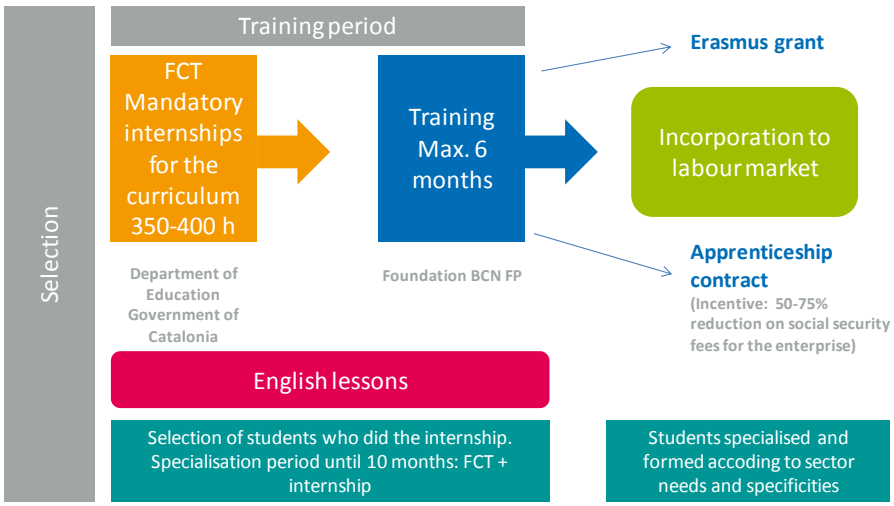
- **Fundació BCN Formació Professional**[62]: the Foundation jointly develops projects between the productive sector, schools and other institutions involved in VET city. Its main objective is to design and implement projects responding to the needs of the productive sector.
- **Port 2000:** it is urban management unit, with legal personality, constituted by the Port of Barcelona in 1988. Under his tutelage, its powers are exploiting the public spaces of Port Vell and New Bocana, as well as maintenance, cleaning and conservation and operation and management office building located on the street d'Escar corner with the Paseo Joan de Borbon. Through the management of public space port, Port 2000 serves citizenship and Barcelona, and promotes the interest and presence of citizens and tourists in the Port.
- **Marina 92**[63]**:** founded in 1992, MB92 is an expert management company in the maintenance refit and repair of super yachts. It counts with facilities of 76.000 m2. It is committed to continue on-the-job training for their employees in areas of naval engineering, risk prevention, languages and design programmes. It is very active in cooperating with other local actors at local and regional level in order to find solutions to match the gap between the offer and demand of maritime training and education programmes and professionals.
- **Barcelona Cluster Nautic**[64]**:** is established in October of 2013 with the goal of transforming water sports activity into an economic driving force for the city, its metropolitan area and for the country, taking full advantage of the existence of a sector which brings together industry, companies, entities and research centres, a mix that has enormous potential to generate wealth and added value. It currently has almost fifty members, including the Town Hall and the Port of Barcelona, Barcelona Regional, Marina Barcelona 92, Marina Port Vell, la Universitat Politècnica de Catalunya (UPC), Consorci El Far and Fundació Navegació Oceànica Barcelona (FNOB), all active partners. Barcelona Clúster Náutic is born out of the conviction that the nautical sector can become a major player in the economic growth of the country and in creating wealth and jobs. The mixed structure of this Cluster, made up of private and public agencies, allows the public administration to have different public policies participate in the entity, favouring its cross-disciplinary profile in benefit to the city as a whole, as well as to the possible integration of regional policies. Furthermore, the existence of an important corporate fabric within the Cluster provides operational facilities, broader and deeper knowledge of the sector and its job market, as well as more possibilities for interaction and transfer of know-how between different players. Barcelona Clúster Nàutic wants to take on a unifying role that articulates dialogue between authority, industry and community.
- **Barcelona Activa**[65]**:** Barcelona Activa is integrated in the Area of Employment, Enterprise and Tourism at Barcelona City Council; it is responsible for promoting the economic development of the city, designing and implementing employment policies for citizens, and encouraging the development of a diversified local economy. For the last 28 years it has been a driving force behind Barcelona and its hinterland's economic activity, supporting policies to develop employment, entrepreneurship and business, while promoting the city and its strategic sectors internationally, but from a regional perspective.

As presented in the figure below, through this programme, vocational training students can carry out the compulsory curricular internships (the so-called FCT – *Formación en centro de trabajo*, workplace training) at one of the around 60 companies and organisations associated to Barcelona Clúster Nàutic and MB'92. Once completed this compulsory internship period, selected students can enjoy a student grant awarded by the Foundation and financially supported by the company (*Beca – Empresa*, Fellowship - Company). Likewise, it is possible to extend this period by an educational specialist Erasmus+ scholarship in companies based in other European cities.

[62] http://www.fundaciobcnfp.cat/index.php/ca/
[63] http://www.mb92.com/
[64] http://www.barcelonaclusternautic.cat/ca/home
[65] http://www.barcelonactiva.cat/barcelonactiva/cat/

At the end of this process, students should count with those very concrete competencies and experience required by the sector which should contribute to open the doors for them to enter in the labour market in this very specific and high-demanding sector.

Figure 8.1 **VET on board programme scheme**



Below, the phases of the programme are described:

6) **Selection:** the initiative counts with a preliminary phase devoted to select the participants who will be part of the programme. In order to do so, the Foundation acts as a facilitator between the company and the schools to know the recruitment needs of the company and to identify and select, together with the schools, the right student's profiles;

7) **Workplace training (*FCT – Formación en centro de trabajo*):** a compulsory training module that each student has to undertake as part of his/her regular VET programme. Its aim is to complement through a practical experience in a company the theoretical modules given at the school so to allow the student to acquire the required work proficiency. This period, which lasts between 350-400 hours (depending on the VET studies) is regulated though a collaboration agreement undersigned by the company, which need an ex ante authorisation to from the competent regional authority to host trainees, the school and the student. Each student has two mentors both in the company and in the school which are responsible to track and assess whether the student has acquired the expertise required for the future professional performance. The company does not have to incur any cost;

8) **Fellowship – company (*Beca – Empresa*):** A selected group of students who have satisfactorily completed the workplace training, would be awarded with a grant from the Foundation to undertake an additional internship with a duration of a maximum of 6 months with a maximum of 5 hours per day. The aim of this 6 months fellowship, that has to be carried out at the same company as the previous training, is to strengthen and deepen the practical learning acquired during the first phase of the Programme (compulsory workplace training). The cost for the company will be between € 367 and € 450 per month depending on the number of effective hours worked by the fellow. However, it will be the Foundation the responsible for managing the fellowships, preparing all the administrative documents, monitoring the training plan and the performance of the student. The Foundation will also carry out a final evaluation of the whole process once the programme is finalised;

9) **English lessons:** one of the lessons learnt from the first edition of the Programme was the need to improve the English knowledge of the students. With this aim, the Foundation signed an agreement with Barcelona Activa to provide and fund English lessons to the students. During the two phases of the programme each participant will be provided with 2 hours per week English lessons tailored to the linguistic needs of the sector;

10) **Erasmus +:** Within this process, the Foundation encourages the students to take part in the Erasmus+ initiative. It tries to support the mobility of students and graduates in VET, in order to acquire, through a stay in another EU country, new knowledge, skills and qualifications that will be useful in their personal and professional development. The Foundation, along with SEPIE, -the Erasmus+ National Agency- establishes agreements for students or VET graduates over 18. The stay would have a duration of 2 months and be awarded with a grant of € 600-800 per month.

Since the programme was launched a total of 55 students and around 10 companies and schools have participated in the initiative.

Table 8.2 **Type and number of participants having attended the VET on board programme**

	2013-2014	2014-2015	2015-2016
Participating students	30	25	Currently undertaking the selection phase
Companies	10	11	Currently undertaking the selection phase
Schools	11	12	Currently undertaking the selection phase

4.6.5 Conclusions and recommendations

The three editions of the programme have proved the added value of the initiative as well as the important benefits for all the participating actors. Companies have reported that it is a very valid tool for them to attract talent, to share the costs of training of their new staff, to reduce the costs of recruitment and, in general terms, to contribute to create a source of qualified young professionals.

As for the students, this is regarded as an excellent initiative to acquire practical skills directly from the industry and adapt their professional profiles to the requirements and needs of the private companies and thus to make easier their transition to the labour market.

An initiative of this nature, which materialises the cooperation of different stakeholders aiming to bring the training and the private sector closer, can clearly contribute to close the gap between offer and demand and provides students with the experience required by the market.

'Maritimisation' of the VET offer

An important success element is that the programme does not intend to create *ad hoc* curricula but, from an existing demand of sea-related jobs offers, existing VET curricula such as carpenters, electronics or hostelry were adapted to the sea, meaning by this that professionals of the sea were integrated in the regular training programmes new knowledge domains referring specifically to the sea: "to be a carpenter in a big ship is not the same as being a carpenter in a big house". This process is also regarded as more efficient than just "creating or setting up brand new nautical VET curricula", which is something that will be more resource-intensive and which will not necessarily bring the same results.

Cooperation between the triple helix and the role of the private sector

All three parts of the helix: private sector, public authorities and VET education providers agree around the idea that VET on Board could have only be achieved because of cooperation, working in different networks and the decisive role of the cluster, facilitating contacts and playing a brokerage role which is very highly valued. It cannot be forgotten that the cluster itself counts as active members with the actual companies that will ultimately hire these students which has been trained in accordance with the needs expressed by them.

In short, although the programme has still a long way to go to improve its performance, mainly with the aim of increasing the total number of students who at the end of the process are hired by the companies, VET on Board can be considered as a success story. It could serve as an example for other similar settings as well.

With respect to the **growth** of the programme, the initiative could be expanded at local level by incorporating additional institutions, education centres and private companies to the programme. In this respect, the partners involved are already working in this direction and a number of meetings, events and informal exchanges are taking place in order to disseminate the programme. This contributes to awareness-raising among relevant stakeholders, and should lead to an increase in the number of students awarded with fellowships and therefore could contribute to increase the overall impact of the programme. Within this process, a need to step up further cooperation with the private sector will be also required.

With respect to **capitalisation**, all the involved participants agree to emphasize that models that work should be shared, looking for good practices to improve and, as a consequence, an initiative as such could be capitalised and extrapolated to other key economic sectors as well as other territories.

4.7 Recent initiatives from Malta: Malta Maritime Forum and Malta Marittima

4.7.1 Introduction and objectives

A group of leading education and training professionals met in Valletta (Malta) on the 11th of December 2015 during a focus group meeting initiated on behalf of the European Commission. During the meeting, several challenges within the maritime industry where improvements could be made emerged, among which the following:

- The maritime industry is very diverse while it overarches various fields from the rather traditional, transport and logistic sector to energy, natural environment, security and tourism. Expanding this scope needs to be taken into account when addressing educational needs;
- There is a need to improve connections and linkages between different ministries (e.g. ministry of transport, ministry of tourism, ministry of education) involved with the maritime and the national agenda;
- A platform is needed to coordinate the work of different actors in the maritime sector;
- National information base about the industry is missing. Therefore we lack an overview of vacancies and jobs for the sector.

One clear signal which came out of the focus group is that many organisations are well aware that the knowledge and skills to education and train the workforce for the maritime sector is available within international networks. However, it is not always feasible to get access to this knowledge. The Malta College of Arts Science and Technology (MCAST), for example, has difficulties in import course material from other countries like the United Kingdom, as it expensive and requires funding.

Next to the international availability of education, a main finding from the meeting is that for a long time there is a clear need for the setting up of a platform to co-ordinate the efforts, aspirations and challenges faced by the various sectors within the Malta maritime industry to bridge the skills mismatch on the islands.

In the year 2015, a number of initiatives were taken both by the government side as well as the industry. They were based on the recognition of the challenges, and formed initial steps to address these challenges. This includes, for instance, the approval of the Integrated Maritime Policy of

Malta and the founding of the implementation agency – Malta Marittima, that is composed of both the government representatives as well as members of the industry, as well as the establishment of Malta Maritime Forum, a platform organised by the industry.

The objective of this case study is to analyse the recent developments in Malta that have contributed to addressing the challenges by establishing means for better cooperation. This will be demonstrated by presenting two initiatives, the Malta Maritime Forum and Malta Marittima – both aiming to facilitate the cooperation in the maritime sector. The case study focuses on Malta Marittime, which appears most advanced in terms of concrete aims and future activities.

4.7.2 Recent initiatives on Maltese islands

Malta Maritime Forum (MMF)

Officially launched in July 2015, the mission of the MMF is to *serve as a common platform for those Maltese interests who are involved in the maritime, logistical and transport industry in Malta. This platform will facilitate communication between the various sectors as well as with Government to assist and promote the development of this industry in general*.[66] The main objectives of the Forum are to:

- Promote the interests of the Maltese maritime industry;
- Assist in the development of new maritime activities;
- Promote research, education and training within the Maltese maritime industry;
- Act as a constituted body so as to consult and be consulted by government in the development of public policies that can have a bearing on the Maltese maritime industry[67].

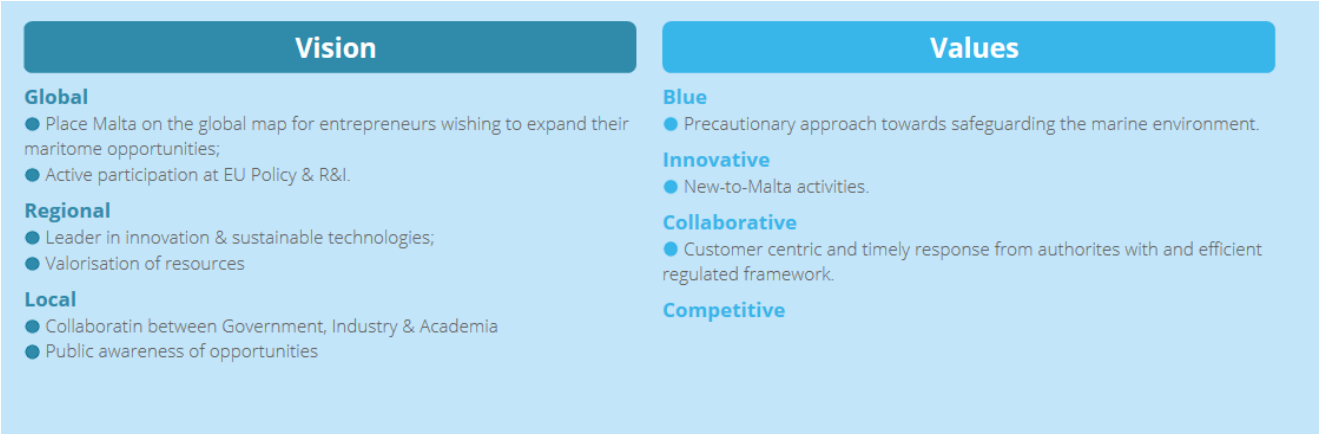
The MMF is a non-governmental organisation, operated on a commercial basis. The features of the platform are similar to a lobby organisation with transport and logistics as the two industries represented. Although promoting, research, education and training is a key objective, how Malta Maritime Forum could exactly help in address the skills miss match and support the link between the industry, training and education system is to this date unknown as the platform was established only recently. In spite of that, the aims of the MMF have the potential to fulfil an important role allowing for more close-knit cooperation of the transport and logistics industry with other actors in the maritime.

Malta Marittima

Malta Marittima[68], an agency under the Government of Malta, was established at the beginning of 2016[69]. Building on the outcomes of the Integrated Maritime Policy[70], one of the Agency's main objectives is to bring industry and government stakeholders together so as to focus and promote the continued and enhanced development of the marine and maritime industries in the Maltese Islands. The vision and values are presented in the figure below.

[66] Statutes of Malta Maritime Forum as presented in Malta Maritime Forum presentation of December 2015. Retrieved from: www.meusac.gov.mt/file.aspx?f=5506
[67] Statutes of Malta Maritime Forum as presented in Malta Maritime Forum presentation of December 2015. Retrieved from: Retrieved from: www.meusac.gov.mt/file.aspx?f=5506
[68] For more information see: http://www.maltamarittima.org.mt/
[69] See the government Legal Notice 41 of 2016 at http://justiceservices.gov.mt/DownloadDocument.aspx?app=lp&itemid=27297&l=1
[70] Government of Malta (2013) Integrated Maritime Policy: The waves that shape us make us stronger. Retrieved from: https://economy.gov.mt/en/public_consultation/documents/integrated%20maritime%20policy.pdf

Figure 8.3 Vision and values of Malta Marittima



Source: Malta Marittima website, 2016

To reach this vision, Malta Marittima has set for itself a number of operational objectives that direct the sector towards a more sustainable, innovative and competitive area with added value of future jobs. In full, the objectives are presented in the Text box below.

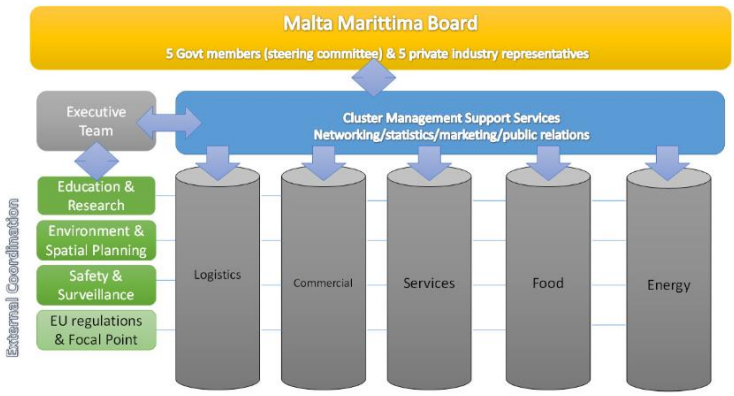
Text box: Objectives of Malta Marittima

- create and promote maritime sectoral clusters;
- maintain open dialogue between private and public stakeholders;
- strengthen the competitiveness and support of the clusters;
- lead the sectors towards innovation based economies;
- promote environmentally sustainable projects;
- propose to Government maritime policy and infrastructural improvements;
- lead towards the creation of increased added value and future proof jobs;
- encourage transfer of knowledge between academy and business;
- promote maritime cultural awareness and education opportunities locally;
- maintain inventory, statistics and progress of sectoral clusters; and
- promote and participate at EU fora and internationally.

The steering committee[71], together with the industry representatives, form a governing board as part of the Malta Marittima Board. Next to that, Malta Marittima is supported by a specialised team of executives who will coordinate the related policies which concern education and research, environment, spatial planning, and safety and surveillance. The executive team is tasked with the stipulated objectives where the most pronounced one is the establishment and provision of support to the clusters which themselves address the diverse array of activities in the marine and maritime domains. **Error! Reference source not found.** presents the organisational structure of Malta arittima.

[71] The steering committee is composed of ten members, five of which are nominated from within the public sector, viz., Transport Malta, Department of Fisheries and Aquaculture, Malta Freeport Corporation, Regulator for Energy and Water Systems, Malta Enterprise; and five others which are appointed by government through a consultation process with industry stakeholders.

Figure 8.4 Organisational structure of Malta Marittima



Source: Malta Marittima website (under construction), 2016

From the desk research and interviews, it has become apparent that the contribution of Malta Marittima lies in three pronounced axes: 1) serving as a one-stop-shop in the overarching maritime, 2) approaching the academic offer on the island as one reflecting the holistic nature of the sector and 3) the development of clusters.

Axis 1) One-stop-shop

The maritime sector encompasses an immense variety of activities and actors that are directly and indirectly linked to the sea. For illustration to name the few - the Ministry of Transport is involved in maritime transport, the Ministry for Sustainable Development, the Environment and Climate change has environmental protection of the coast under its portfolio while the Ministry for Energy and Health covers ocean energy. And although one may have good intention in mind to seek and establish cooperation, when it comes to making decisions and commitments, each representative defends their thematic area. The fragmentation of the maritime sector is not only the case on Maltese Islands. However, on Malta the fragmentation in the overarching nature of the maritime sector has been a great obstacle in understanding what the sector needs and how to deliver those needed services, skills and expertise in playing field that has a nature of extensive bureaucracy of all ministries involved.

The driving force for establishing Malta Marittima was to enable efficient mediation among all actors involved and stimulate entrepreneurship. It has been established to offer a one-stop-shop service with executives as well as board members from all corners of the sector, having a wide network of contacts in the maritime. How the Malta Marittima will exactly achieve this will become more clear in the coming months. At this stage of time, the government representatives speaking about Malta Marittima are well aware of its potential and ability as a smaller size organisation with extensive network to serve as a mediator and driver of innovation in the sector.

Axis 2) Academic offer reflecting the holistic nature of the maritime sector

The current offer of the University of Malta and Malta College of Arts Science and Technology (MCAST), is tailored to traditional views on the maritime sector. The courses offer training on transport and logistics, engineering and maritime law, geo-sciences and oceanography. Maritime is however broader than this, encompassing areas such as spatial planning, security, natural environment, ocean energy and tourism. Next to that, giving more business and economic nature to the courses is required to enable blue growth on Malta., according to many of the experts consulted.

Malta Marittima is well aware of the need that the academia has to expend in its offer to train students into professionals in more disciplines of the maritime and actively has initiated its work on achieving this. Discussing with the MCAST the possibility to include modules in bachelor's and master's studies that widen the expertise and skills of the prospective graduates is one of the first steps.

Axis 3) Development of clusters

There is a wide range of companies and organisations already active in the maritime industry on Malta, services vary broadly. The grouping of these activities holds potential for establishing a number of closely-knit maritime clusters that will bring the business and non-business members together. Each sectorial cluster will be comprised of businesses, industry associations, government departments, academic and research institutions.

4.7.3 Conclusions and recommendations

Both the Malta Maritime Forum and Malta Marittima have been established within the scope of one year to organise a way that different industries and academia within the maritime sector have shorter ways to find each other. Although only recently in place, both the MMF and Malta Marittima have the aspiration in implementing a holistic approach to finding solutions to the challenges that industries and the academia in the maritime face. Through the formation of the Integrated Maritime Policy and its implementation agency – Malta Marittima - Malta has also experienced the need for a philosophical change in the approach towards maritime within the academia as it is about more than only transport, logistics and engineering.

Finding ways to make the cooperation between the industry, education institutions and business possible and more pronounced within the maritime does not only involve knowing the right people but also being able to change mind-sets of actors involved. The experience of Malta Marittima shows that although ministries want to cooperate and support the industry, the bureaucracy and leisure speed of communication from the government organisation is daunting the cooperation. This in turn slows the process in supporting the education institutes in developing programmes that support the immediate needs of the industry.

The Government of Malta is in the process of setting up a National Maritime Education Committee, which will be chaired by the Ministry for Education, Malta Marittima and the major educational stakeholders will be represented on the Committee. The Committee will be looking into the various training opportunities, available on the island. The idea is to integrate the efforts of the different training institutions and come up with effective proposals, such as introducing elective subjects related to Maritime in existent courses. Needless to say that these measures will be driven by the industry's requirements.

From the experience of Malta Marittima, lessons can be drawn and shared with other Mediterranean countries when wanting to adopt similar education initiatives. The overarching aim of the agency prior to its establishment was to provide an efficient way for stakeholders in the maritime network to find each other in looking for ways to solve the challenges at hand. With this narrative, Malta Marittima has gained the momentum to have all involved ministries and industries with the sector behind them.

More broadly speaking, the case of Malta shows that DG MARE could support the development in overcoming the gap between the industry needs and what the academia offers in the followings ways. Nowadays, gaining access to education may not need to be limited to spatial area of a region or country. The difficulties on Malta with developing courses or modules at home as well as in

bringing them in from outside, would be a good reasons for DG MARE to facilitate the forming of a platform for open educational and training materials.

Next to that, making clear which institutions offer which courses and qualifications, would be helpful. DG MARE could use existing EU initiatives and platform to ensure the involvement of the maritime sector (as for instance, DG EAC supports the U-Multirank tool, based on U-Map).

4.8 Blue Career Centre for the Eastern Mediterranean

4.8.1 Introduction and objective

A group of leading education and training professionals, focusing on naval engineering, and business representatives[72] met in Larnaca (Cyprus) on 15th January 2015 during a focus group meeting initiated on behalf of the European Commission. During the meeting, participants agreed unanimously to establish a **Blue Career Centre for the Eastern Mediterranean**.

The global aim of the Blue Career Centre is to contribute to the creation of sustainable economic growth and jobs from the seas and thus to the stabilisation and prosperity of the Eastern Mediterranean region. After all, the East Mediterranean Sea has been a unifying element in this region for thousands of years already.

More specifically, the Blue Career Centre *seeks to provide prospects for young jobseekers in the maritime economy in the Eastern Mediterranean, and to support businesses in finding the right staff with proper qualifications.*

The Blue Career Centre will be established in Cyprus, and include active participation and engagement of all countries, institutes and/or individuals involved from Greece, Turkey, Egypt, Lebanon and Jordan notably.

4.8.2 Possible actions

Building on the discussions within the focus group, a range of actions could be undertaken by the Blue Career Centre. Possible elements of action, considered and discussed by the participants are:

Short-term actions:

1) Catalogue the offer of maritime education and training in the region, including availability of infrastructure;
2) Promote the sharing and pooling of resources, such as maritime simulators and a training vessel;
3) Blue Career Fair of the Eastern Mediterranean;
4) Promote the mobility of students and staff within the region;
5) Make efforts to balance the demand and supply of maritime professionals in the region.
6) Work towards the harmonisation of requirements for maritime professional training, focusing on practice (mostly sea-faring);
7) Act as a body towards the application of projects (e.g. EU funded projects);

[72] From the following 6 countries: Cyprus, Greece, Egypt, Turkey, Lebanon and Jordan

Participants agreed during the focus group that – in order to produce success and sustainability – it would be needed to focus on a limited number of actions – at least in the beginning. It was also agreed to focus first on those actions which are expected to produce short-term results – to demonstrate the viability of the initiative, and only then to move to longer-term actions.

The objective of this note is therefore to review these proposed actions in some detail, and explore to what extent they can be elaborated and prioritised by the initiators and the partners of this initiative.

Criteria proposed to prioritise these actions are as follows:

a) Needs for young jobseekers in the maritime economy of the Eastern Mediterranean, and to support businesses in finding the right staff with proper qualifications;
b) Added value for taking forward at the Eastern Mediterranean scale;
c) Feasibility – taking into account existing experiences to build on and the time horizon needed to book results.

Action 1: Catalogue the maritime education and training offer in the region

Description: Taken together, the institutes participating in the Blue Career Centre initiative provide an excellent starting point for such a catalogue. They include established as well as new training programmes, both at vocational and higher education level. Noteworthy are in this respect the Arab Academy of Sciences and Technology, which added Maritime Transport in its portfolio since 2013, as well as the Maritime Academy of Cyprus, established in late 2015 and starting to operate in 2016. A catalogue would provide a consistent overview of the training offer, and allow for future cooperation, mobility of students in the region and the development of joint courses. As a start, the overview of partners involved in the Blue Career initiative is provided in Annex 6 – profiles of the participants of the Larnaca focus group.

Assessment: As a first step in cooperation, it is essential to build a full overview of the existing training offer in the region, including degrees offered, length of courses, overviews of modules, languages used and pricing. Reference to be made to any existing joint programmes and initiatives offered right now, as well as information on skills qualification and recognition issues and procedures to overcome these. It would be very useful to include an overview of existing infrastructure, e.g. marine simulators, training vessels and other infrastructure – providing input to any pooling and sharing initiatives (see Action 2 below). Experience from similar initiatives (e.g. Erasmus Mundus programmes) points to the need to invest time and efforts into a joint understanding of the maritime education and training offer in the region. This action can be considered feasible and be carried out in the short-term (2016).

Action 2: Promote the sharing and pooling of resources, such as training simulators and a training vessel

Description

The costs of maritime education and training are relatively high, and this is due in part to the need to provide real-life experiences and skills development through maritime simulators, and spending time on board of ships. Maritime simulators are essential for a range of nautical professions, not only for shipping but also for other activities including offshore oil and port-related activities (tugging). Maritime simulators require high upfront investment costs, and represent a major investment for many of the maritime education and training institutes The availability of such infrastructure amongst participating institutes needs to be properly mapped (see Action 1 above). It is already clear that certain institutes are short of such up-to-date infrastructure, whilst others are well-equipped. This builds the case for exchanges on experiences in using such infrastructure, market trends, joint purchases and/or pooling and sharing of existing resources.

In this respect, the infrastructure of the Arab Academy for Sciences, Technology and Maritime Transport deserves to be highlighted, as it can be considered elaborate, and advanced if not world-class:

- Marine Simulators (Full Mission Ship Handling Simulator, Integrated Bridge System (IBS), TUG Boat Simulator, Small Fast Ship Simulator), Vessel Traffic Service Simulator (VTS), ECDIS Lab Simulator, Mini Bridge Simulator, Full Mission Engine Room Simulator, Offshore Simulators, Full Mission Offshore Vessel Simulator "Class A", Full Mission Offshore Crane Simulator "Class A", Dynamic Positioning Labs, Liquid Cargo & Natural Gas Simulators, Liquid Cargo Handling Simulator, Natural Gas & Petrochemicals Simulators);
- Engineering Workshop (Metals Workshop, Marine Diesel Engine Workshop, Marine Engineering Laboratory, Steam Laboratory);
- Global Maritime Distress & Safety System Simulators;
- Maritime & Offshore Safety Facilities (Swimming Pool Area, Modular Egress Training Simulator (METS), Helicopter Model on Helideck, Advanced Medical lab, E-learning Classroom, H2S control programs classroom (OPITO Approved));
- Fire Fighting Facilities (Fire Fighting Lab, Fire Ground);
- Environmental Protection & Crises Management Centre (The Crisis Management Simulator, Chemical Analysis Laboratory, Oil Spill Combating Training Center);
- Metrology Station;
- Diving Center;
- Training Vessel – the 90 meter purpose-built Aida IV ship;
- Maritime Training & Sail Sports Center.

Assessment

The sharing and pooling of resources can be considered a promising activity, as access to such infrastructure is not equally spread in the region and as there is a strong willingness of the well-equipped institutes to collaborate with others in the region. Sharing of infrastructure provides important advantages, such as lower costs as well as increased transparency and harmonisation of training offer amongst participating institutes. Several initiatives already exist in this domain and within the EU, such as “Train the Trainer course material for Inland Navigation Education and Training [73]”. This initiative uses the same didactical methods for simulators that would raise the level of transparency but also allow a greater mobility of staff being trained anywhere throughout Europe. Additional advantages are that industry could rely on well qualified staff from other European countries as well; thus flexibility of the European IWT labour market would be increased. The common level playing field would contribute to an increased image of the IWT profession throughout Europe. When developing the methodological approaches for the didactical manual, cultural differences will also be addressed. This project analyses in depth how the maritime sector is realising the implementation of the Standards of Training, Certification and Watchkeeping (STCW) by means of the didactical use of simulators. It will then review in which form this approach is feasible for the inland navigation sector and set up a process for establishing benchmarks for a didactical manual including a train-the-trainer course aiming the implementation of STCIN. A methodology for the development of a didactical manual will be established.

Another initiative is the Vasco da Gama – Work package 2: Maritime Simulators[74]. This work package included a diversity of activities addressed to the development of training with maritime simulators based on the experience of relevant European training institutes. It mainly focused on:

[73] http://www.adam-europe.eu/adam/project/view.htm?prj=10733#.VsSF2P72aUl
[74] http://www.vasco-da-gama.eu/training-for-greener-and-safer-maritime-transport-project/documents-project-vasco-da-gama/training-and-maritime-simulators.html. More information on this work package will be obtained during the Vasco da Gama closing conference, held on 1st March 2016 in Brussels.

- Extension of the use of simulators within the curriculum of seafarers and their management, to compare methods to use simulators in order to define a best practice and to define instructors' skills to use simulators;
- Improving uniformity in training with simulators at EU level, through the development of a cooperative network of training institutions;
- Making the most benefit of best practice, training infrastructures and equipment available in this field.

It has included an inventory of maritime European simulators facilities and the drawing of a map with a location of different kind of simulators and different kind of training associated

Exchanges during and surrounding the Larnaca focus group also demonstrated that there is indeed a strong interest in sharing similar experiences with existing maritime training simulators in the region, including the sharing of market trends and experiences. For example, new generation maritime simulators are entering the market and offering high performance at reduced costs (e.g. V-STEP certified simulator series). Shared purchasing of maritime simulators would offer many benefits, such as 1) Stronger position vis-à-vis sellers; 2) Possibilities for building and maintaining joint instruction programmes, allowing for the easy exchange of; 3) Sharing of experiences in the performance of such simulators over time; 4) Harmonisation of training programmes; and 5) Increased exchange of students and staff (see Action 3 below).

A particular opportunity in the Eastern Mediterranean is offered by the availability of a Training Vessel, owned by the Arab Academy of Sciences, Technology and Maritime Transport. The modern purpose-built training ship – with a length of over 90 metres- is fully equipped and provides rich learning experiences to a wide range of maritime students and professions. The vessel is currently already used as part of the curriculum of the Jordan Academy of Maritime Studies.

Taken together, this Action is considered much needed. The Eastern Mediterranean basin appears to be the right scale for starting this action, due to the short distances between the institutes involved and the cultural proximity. However, it is important to make clear arrangements between the partners involved (particularly related to costings and access), and detail these to a great extent – in order to prevent any future misunderstandings.

Action 3: Promote mobility of students and staff within the region

Description

Mobility of students and staff has many advantages. It provides a rich experience for those involved, both at technical as well as at cultural level. It also increases the employability of the students and staff, as the experience gained can be put on their CV and help to obtain good jobs. A recent initiative in this respect is the establishment of the Maritime Academy in Cyprus, by the University of Nicosia, the Arab Academy of Science, Technology and Maritime Transport, the Maritime Institute of the Eastern Mediterranean and Intercollege. The Academy will offer shipping-related courses taught in English to Cypriot and foreign students. The courses include Shipping & Logistics Management, Maritime Transport, Marine Engineering and Marine Electrical Technology.

Assessment

Many initiatives already exist at the European level, notably the Erasmus + programme. Erasmus has now many components and includes not only the famous Erasmus Students Exchange programme (already more than 1 million students having benefitted from this exchange), but also the now mainstreamed Erasmus Mundus programme (offering opportunities to non-EU citizens) and the Marie-Slodowska Curie programme (offering opportunities for researchers and staff). But other opportunities exist as well, such as the Skills In light of the existing initiatives, a self-standing

mobility programme for students or staff is not recommended, also in light of the limited skills and qualifications recognition across the region and the complexities involved in managing student mobility (including visa's, housing arrangements, language barriers, etc.). Instead, it is recommended to link this Action to the previous Action 2, and to attach such mobility to initiatives to pool and share maritime infrastructure and equipment and to existing institutions, including the recently established Maritime Academy of Cyprus. At the same time, it is worth exploring how students and staff in the region can take advantage of already existing (EU schemes) and promote these amongst students and staff in the region[75].

Action 4: Blue Career Fair of the Eastern Mediterranean

Description

The "Blue Career Centre for the Eastern Mediterranean", although based in Cyprus, would have branches or representations in the various countries of the region. A concrete joint initiative discussed – continued and detailed after the focus group meeting - was the organisation (from 2017 onwards) of an annual regional Job Fair for the Blue Economy to be called "The Blue Career Fair of the Eastern Mediterranean". This Blue Career Fair will bring together and allow the interaction of students/graduates and their potential employers in a 3-day "festival" which will include competitions among teams from the various MET institutions, booths for the Academies & Institutions as well as the respective sector Companies-potential Employers /Recruiters.

Participants taking part in this discussion agreed that such a Blue Career Fair would also include presentations by potential employers, conferences on relevant subjects, interviews of the job-seekers by potential employers, but also –outlets with ethnic food & entertainment (e.g. the Falafel Kiosk, the Donner Kebab Kiosk, the Souvlaki Kiosk, the Lebanese sweets Kiosk etc) as an incentive for the public to also pass from there with their children thus raising the visibility of and awareness on the blue professions.

The following competitions/games could take place on the following (indicative only) subjects:

1. Simulators (Engine, Deck, Cargo) with specific scenarios escalating in difficulty;
2. Seamanship;
3. Engineering (e.g. dismantling and the assembling an engine / machinery within a specific time);
4. Search and Rescue;
5. Fire-fighting;
6. Survival at Sea;
7. First Aid;
8. Helicopter Escape;
9. Sailing;
10. Rowing with a liferaft;
11. Fishing;
12. Cooking;
13. Etc.

So each Institution will form its own Team (or even more teams if they wish) which will take part in the various games collecting points which will then allow the Judging Committee – consisting of Industry representatives - to select the best Crew(s). There will be Games for the last year Students as well as for the younger ones. The Group was confident that we can also determine the proper incentives for the teams to really compete for the first place.

[75] Erasmus + is a European programme which is implemented by one or more National Agencies in Member States. See http://www.erasmusplus.cy and http://www.inedivim.gr/ or https://www.iky.gr

There will be also a competition for the most innovative ship model - for the respective naval architecture students - in order to receive the prestigious “Award for Innovative Ship Design”.

Online job fairs could also be organised by the Blue Career Centre in the long term.

It was agreed however that the chances of success of the initiative would be highest by concentrating initially on a few of these aims only – a targeted approach really.

- A maritime simulator game – in which teams of naval students compete; the winning team will be offered a job by one of the sponsoring shipping companies;
- Olympic games - …;
- Use of the training vessel for dedicated training sessions and events across the region (up to the Gulf).

Assessment

This initiative can be considered highly favourable, as the interest amongst participating actors is very high. Furthermore, the Action can already build on the existing Blue Career Days, organised by the Maritime Institute for the Eastern Mediterranean for several years already. It is an excellent opportunity to provide visibility to the Blue Career Centre and engage with the broader community of maritime professionals and students.

Action 5: Work towards the harmonisation of requirements for maritime professional training (mostly sea-faring)

Description

This issue was much discussed during the focus group, and benefited from the presence of the Ministry of Education of Cyprus. The competent body for quality assurance and accreditation of the programmes offered by Private Institutions of Higher Education on Cyprus is the Council for Educational Evaluation-Accreditation (Symvoulio Ekpedeftikis Axiologisis Pistopiisis, SEKAP), which is a member of ENQA – the European Association for Quality Assurance in Higher Eduation[76]. At present, a number of programmes offered by the Private Institutions, have been evaluated and accredited by SEKAP. These programmes fall into the following categories:

- Academic and Vocational programmes of study lead to the following qualifications: Certificate (1 year), Diploma (2 years) and Higher Diploma (3 years). For access to these programmes the apolyterion or equivalent qualification is a prerequisite;
- First cycle programmes (4 years), lead to the award of a Bachelor Degree. For access to these programmes the apolyterion or equivalent qualification is a prerequisite;
- Second cycle programmes (1 to 2 years) lead to the award of a Masters Degree. The prerequisite for access to these programmes is the Ptychio, or Bachelor, or equivalent qualification.

The competent national body for the recognition of higher education qualifications is the Cyprus Council for the Recognition of Degrees (Kypriako Symvoulio Anagnorisis Titlon Spoudon, KYSATS). KYSATS recognises equivalence, or equivalence-correspondence for first cycle titles, or just equivalence for postgraduate titles (second or third cycle). KYSATS may also recognize joint degrees.

The establishment of a Quality Assurance Agency has been approved by the Council of Ministers of the Republic of Cyprus. The aim of this Agency is to promote quality assurance in both the public and the private institutions of higher education, through various measures which include external accreditation and development of internal quality culture. These efforts are in line with the Berlin

[76] http://www.enqa.eu/

Communique, the ENQA Standards and Guidelines on QA, as accepted by the Bergen Communique and the Agreement on Quality Assurance in the EU.

Assessment

Skills and qualification recognition in the maritime professions pose a major challenge. Whilst higher education degrees within the EU are recognised through the Bologna process, this is not yet the case for non-EU programmes neither for vocational education and training programmes. Actions towards harmonisation in vocational training take place in the context of EQAVET – European Quality Assurance in Vocational Education and Training. This action is therefore considered to be not necessarily of an East Mediterranean scale. Rather, active support to the Greek and Cyprus members to prioritise maritime professions is an alternative. Furthermore, such harmonisation efforts require a very long time span – hence the recommendation to not prioritise this action right from the start.

Action 6: Promote the balance between demand and supply of maritime professionals in the region

Description

A strong need is felt to better balance the demand and supply of maritime professionals in the region. The background lies in the fact that large numbers of maritime professionals are being educated on the Southern or Eastern shore of the Mediterranean, whilst appropriate employment opportunities are offered on the Northern shore (e.g. Greece, Cyprus, Turkey). In order to book progress, two distinct action can be thought of:

a. Better map and understand the demand and supply of maritime professionals in the region. In this respect, a monitoring study is currently being launched by the Cyprus Shipping Chamber (February 2016);
b. Take actions that take away the necessary barriers; such barriers can be manifold including language, cultural and/or religious barriers, perceptions, etcetera.

Assessment

Mapping and monitoring the demand and supply of maritime professionals in the region is an essential activity. However more thought and efforts are needed to still develop this action. Possibility would be to build a matching database for maritime professionals in the region, and/or build a specific maritime module to an already existing matching database in the region (see also the suggestion under Action 4 – the Online Job Fair).

Any actions to take away barriers between demand and supply require close cooperation between maritime educational institutes involved and employers (both through Chambers of Commerce as well directly through ship owners). Progress can most likely be booked by setting up a specific Task Force or Roundtable including leaders from both demand and supply side.

Action 7: Act as a body towards the application of projects (e.g. EU funded projects)

Description

Many EU and international funding opportunities exist, notably in the area of education (Erasmus +), but also in the promotion of researcher mobility (Marie-Slodowska Curie, now part of Erasmus +) and research cooperation (notably Horizon 2020). The Blue Career Centre can act as an antenna to exchange information on such opportunities and to bring interested partners together – in close cooperation with the Erasmus + National Agencies[77].

[77] Erasmus + is a European programme which is implemented by one or more National Agencies in Member States. See http://www.erasmusplus.cy and http://www.inedivim.gr/ or https://www.iky.gr

Assessment

Although cooperation in application of projects is always welcomed, this action may not necessarily be a top priority as it could possibly side-track the focus of the centre. Furthermore, the variety between institutes involved (higher as well as vocational institutes) causes differences in interest in such projects. In addition, several existing initiatives (universities such as the National Technical University of Athens, as well as maritime institutes including the Maritime Institute for the Eastern Mediterranean) already offer such services. or intend to do so. Finally, many of such programmes require a larger geographic scope of cooperation, hence the Eastern Mediterranean may not be the most appropriate scale.

4.8.3 Conclusions and recommendations for the Blue Career Centre

The initiative to establish a Blue Career Centre for the Eastern Mediterranean is much-welcomed and needed. It builds on existing initiatives already taken towards cooperation in the region, and can draw on experiences and resources already in place.

When reviewing the above 7 actions, the first 4 actions are considered most promising in the short-term (catalogue of maritime education and training offer, pooling of resources, and related to that promote the mobility of students, and organise Blue Career Fairs). The remaining actions 5 (skills recognition) and 6 (balancing demand and supply in the region) are considered important and they need to be undertaken in order to build long-lasting progress towards the objectives of the Blue Career Centre, however they are not likely to produce results in the short term. Nevertheless, this prioritisation is only to be seen as the start of an exchange and debate with the initiators and partners of the initiative – who will need to develop further ownership of these actions still.

When discussing these actions and when taking them forward, the following considerations can still be made:

- A Blue Career Centre for the Eastern Mediterranean will be more successful in case of existing trust and cooperation among the institutes and persons involved. In this respect, excellent bilateral links already exist (e.g. between Cyprus and the Arab Academy, between Cyprus and Greece, between the Arab Academy and Jordan as well as Lebanon) – and it is important to build on these;
- A need to make use of each other's strengths – and to take the time to discover these and invest time thereto on networking;
- Assign clear leadership and participation in the Blue Career Centre as a whole and in rolling out the various actions. It needs to be clear who joins the initiative after the necessary consideration, and who is able to lead/take part in the elaboration and implementation of the actions;
- A need to develop a business plan/model including aspects such as finance and governance;
- It is important to preserve and build the momentum of the initiators and agree on precise timelines and milestones needed for its development and implementation.

4.9 Blue Biotechnology & Aquaculture Postgraduate Course for the Central-East Mediterranean basin

4.9.1 Introduction and objective

A group of leading education and training professionals, focusing on blue biotechnology and aquaculture representatives[78] met in Athens (Greece) on 19th January 2016 during a focus group meeting initiated on behalf of the European Commission. During the meeting, several ideas emerged, among which the following:

- Formulate an international course on blue aquaculture & biotechnology;
- Establish a network for management/exploitation of coastal hypersaline ecosystems;
- Set up an international training network to train people on proper management of special ecosystems that will include training in molecular approaches, proper use of biotechnology tools towards biomonitoring, quality assessment etc., setting the criteria for quality assessment, use of biotechnological tools (hatching characteristics, designing of genetic/molecular markers, molecular techniques, use of bioinformatics);
- Establish focal points to support submission of EU proposals (for the non-EU Member States).

Following consultations with the participants it was agreed to join forces and establish a **Joint Blue Biotechnology & Aquaculture postgraduate course for the Central-East Mediterranean basin.**

The global aim of the Joint Blue Biotechnology & Aquaculture postgraduate course is to contribute to the creation of an interdisciplinary flexible programme that will allow the graduates to have a very good understanding of the marine biotechnological opportunities especially in the area of the Central-East Mediterranean.

Institutions from Croatia, Cyprus, Egypt, Greece, Italy and Jordan but also from Israel, Slovenia, Turkey and Lebanon can join forces and create a joint flexible postgraduate course that will offer educational, training and exchange possibilities among the participating institutions. The postgraduate courses can be organised into:

1) A joint Master of Science programme;
2) Summer schools;
3) Distance Learning (Lifelong education) opportunities.

The implementation of the joint Blue Bio & Aqua Postgraduate Course programme will be performed by expert members of the Aristotle University of Thessaloniki (AUTh, Greece), the National & Kapodistrian University of Athens (NKUA, Greece), the University of Cyprus (Oceanography Center), the University of Zagreb (Croatia), the University of Udine (UNIUD, Italy), the University of Jordan (Marine Science Station, Aqaba, Jordan), researchers from accredited domestic or foreign foundations (CNR- Institute of Biomolecular Chemistry, Italy; The Agricultural Research Institute in Cyprus, The WorldFish Centre in Egypt), holders of doctoral diplomas with adequate scientific or authoring or research activity in the discipline of the M.Sc. program, invited professors of other Departments of domestic or accredited foreign Universities, as well as other categories of teaching staff. The existing facilities of the above Knowledge Producing Institutions (Universities, Technological & Research Institutions) will be used for the operation of the joint postgraduate courses.

The selected candidates will pay tuition fees and this will safeguard the sustainability through time.

[78] From the following 6 countries: Croatia, Cyprus, Egypt, Greece, Italy and Jordan.

The joint Blue Bio & Aqua Postgraduate Course programme will aim to:

1) Bridge the gap between EU and non-EU countries in the East Med area;
2) Bridge the gap between academia and industry. The joint Blue Bio & Aqua Postgraduate Course will act as the bridge between the Knowledge Producing Institutions (KPI) and the Industry and thus by adopting suitable courses, more suitable and well-fit graduates that can be absorbed by the regional Industry will be more fitting to this purpose;
3) Facilitate young people to get a job in the biotechnology and aquaculture sector by acting as a career centre and by promoting the best skills & talents through rewarding excellence;
4) Facilitating young people to make theses on real industry– led problems and issues, thus facilitating the interaction between KPI and the industry;
5) Promote and enhance the knowledge of existing employees in order to increase their capacity and knowledge and strengthen their employment positions, through e-learning.

4.9.2 Existing initiatives for Joint Master Courses in the region.

Erasmus Mundus Joint Master Degrees

There are several initiatives at the EU level as well as between EU and non-EU countries for Joined Master Courses. The most prominent initiatives are under the Erasmus Mundus Joint Master Degrees (EMJMD) initiative and include:

- CoMEM[79] - Erasmus Mundus MSC Coastal and Marine Engineering and Management (no partners from Central and East Med);
- ACES[80] - Joint Masters Degree in Aquaculture, Environment and Society (4 partners including the University of Crete, Greece);
- MEREMMC[81] - European MSc in Marine Environment and Resources (6 partners; none from Central and East Med).
- WACOMA[82] - Erasmus Mundus Master in Water and Coastal Management (6 partners; including the University of Bologna).

EMJMD is a high-level integrated international study programme of 60, 90 or 120 European Credit Transfer and Accumulation System (ECTS)[83] credits, delivered by an international consortium of higher education institutions (HEIs) from different countries and, where relevant, other educational and/or non-educational partners with specific expertise and interest in the study areas/professional domains covered by the joint programme. Their specificity lies in the high degree of integration and the excellent academic content and methodology they offer. EMJMD proposals at application stage must present fully developed joint study programmes, ready to run and to be advertised worldwide immediately after their selection. In this context, the EMJMD selection process will be very selective with the aim of supporting only the very best proposals.

The European Marine Biological Resource Centre

The European Marine Biological Resource Centre (EMBRC[84]) is a distributed research infrastructure that aims to provide a strategic delivery mechanism for excellent and large-scale marine science in Europe. The MoU signatories are Belgium, France, Greece, Israel, Italy, Norway, Portugal, Spain and the United Kingdom. With its services, EMBRC supports both basic and applied research based on marine bio resources and marine ecosystems. In particular, EMBRC

[79] See: http://www.ntnu.edu/studies/mscomem
[80] See: http://www.sams.ac.uk/erasmus-master-aquaculture
[81] See: http://merconsortium.eu/
[82] See: http://erasmusmundus.uca.es/en/content,3,erasmus-mundus
[83] ECTS is a standard for comparing the study attainment and performance of students of higher education across the EU and other collaborating European countries. For successfully completed studies, ECTS credits are awarded. One academic year corresponds to 60 ECTS credits that are equivalent to 1500–1800 hours of study in all countries respective of standard or qualification type and is used to facilitate transfer and progression throughout the Union.
[84] See: http://www.embrc.eu/

aims to drive forward the development of blue biotechnologies. EMBRC provides the suitable research environment for users from academia, industry, technology and other sectors.

EMBRC has started to build fruitful connections and collaborations with several ongoing initiatives, projects and sister research infrastructures. In the coming years, EMBRC seeks to intensify existing collaborations, broaden its network, and to build new partnerships both in Europe and globally. EMBRC is part of the ESFRI working group “Biomedical and Medical Sciences”, and naturally has strong links to the Environmental Sciences. EMBRC services are also closely linked to the biotechnology sector. Until mid 2016, EMBRC aims at establishing a legal structure in the form of a European Research Infrastructure Consortium (ERIC). It will also be an important period for building the EMBRC headquarters in Paris, for initiating and intensifying international collaborations, and for developing the EMBRC services. The European Marine Training Portal, which started to be developed in the preparatory phase, is already ready-to-use. EMBRC will become operational in mid 2016 and will serve its users for approximately 25 years. The long-term partnerships of EMBRC will enable advanced integration of marine biological research infrastructure in Europe as well as sophisticated joint development activities at the European scale.

Based on the need for an integrated information portal of marine science education and training in Europe, EMBRC started in 2013 to develop a portal gathering European educational programmes and courses related to marine sciences. The European Marine Training Portal[85] is continuously updated and it will grow throughout time.

The ERACOM M.Sc. program

Existing initiatives include also the newly established Joint Master of Science Programme ERACOM (ERACOM M.Sc. program) entitled “Ecological Risk Assessment and Environmental Management of Coastal Resources” which is organised by the School of Biology, Aristotle University of Thessaloniki (AUTh), Greece, in cooperation with the Department of Biology of the University of North Carolina, Charlotte, UNCC-USA and Department of Life and Environmental Sciences of Marche Polytechnic University, Ancona, Italy (Dipartimento di Scienze della Vita e dell' Ambiente DiSVA, (Università Politecnica delle Marche, UNIVPM)[86] The M.Sc. Diploma is awarded by the Aristotle University of Thessaloniki and is written in English, Greek and Italian languages. This programme follows an integrated policy based on the Marine Strategy Framework Directive[87].

The network of Higher Education Reform Experts

It is important also to mention The network of Higher Education Reform Experts (HEREs[88]) which is a pool of experts supporting the modernisation of higher education in countries neighbouring the EU. Their activities are financed through the Erasmus+ programme and coordinated at the local level by the National Erasmus+ Offices (NEOs). Coordinated by the University of Barcelona and in partnership with the European University Association (EUA), they comprise the consortium ‘SPHERE’ (Support and Promotion for Higher Education Reform Experts), an initiative steered by the EC and implemented by its Executive Agency for Education, Audio visual and Culture. SPHERE will provide training and networking for Higher Education Reform Experts (HEREs) and National Erasmus Plus Offices (NEOs[89]) in countries neighbouring the EU (former Tempus partner countries) between January 2015-December 2017. In the Partner Countries concerned (Western Balkans, Eastern and Southern Mediterranean countries, Russia and Central Asia), the National

[85] http://www.marinetraining.eu/

[86] see: http://eracom.bio.auth.gr/

[87] Directive 2008/56/EC of the European Parliament and of the Council of of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive).

[88] See: http://supporthere.org/

[89] See: https://eacea.ec.europa.eu/erasmus-plus/contacts/national-erasmus-plus-offices_en

Teams of Higher Education Reform Experts provide a pool of expertise to local authorities and stakeholders to promote reform and enhance progress in higher education. They participate in the development of policies in higher education in their respective country. HERE activities are based on "peer to peer" contacts. Each national team consists of five to fifteen members. The HEREs are experts in the field of higher education (Rectors, Vice-Rectors, Deans, senior academics, international relations officers, students etc.).

The Mediterranean Science Commission (CIESM)

The Mediterranean Science Commission (CIESM[90]), with headquarters in Monaco, has grown from the eight founding countries of its origin to 23 Member States today. CIESM has a proud, century-long legacy which not only fosters the exchange of scientific standards and ideas, but maintains a constructive, peaceful dialogue among populations divided for too long by historical conflicts.

CIESM is structured into six Committees: Marine Geosciences, Physics and Climate of the Ocean, Marine Biogeochemistry, Marine Microbiology and Biotechnology, Marine Ecosystems and Living Resources, Coastal Systems and Marine Policies. They organize research workshops, mostly focused on emerging scientific issues, communicate significant discoveries, identify remaining gaps in knowledge, provide impartial analyses of oceanographic trends, and engage in cooperative initiatives at the interface between marine disciplines. CIESM support a network of more than 2000 marine researchers in over 30 countries, applying the latest scientific tools to better understand, monitor and protect a fast-changing, highly impacted Mediterranean Sea. CIESM runs expert workshops, collaborative programmes and regular congresses, delivering authoritative, independent advice to national and international agencies. CIESM Programmes originate from key recommendations of CIESM Research Workshops. While very different in their objectives, they all share the following characteristics: (i) they are carried out at the whole Mediterranean Basin scale; (ii) they have a medium- to long-term horizon; (iii) the participating scientists from both Mediterranean shores use agreed, similar CIESM protocols for sampling and analysis, with a policy of open access to the pool of data collected.

At the moment 7 CIESM programmes[91] are in full operation, involving a large number of associated research institutes in CIESM Member States, and they monitor parameters of importance for understanding the fast-changing dynamics, biodiversity and ecosystem services, hydrology and health of the Mediterranean and Black Seas. The latest addition is the Marine Economics Programme, based at CIESM headquarters so as to directly connect up-to-date economic thinking with the latest, relevant developments in marine research. The aim is to embed a socio-economical dimension around the marine science sectors of CIESM activity, with a view to contribute original insights for policy and decision makers.

Results Analysis

Despite the above initiatives, it is notable that in the region of East Med, there is a lack of transnational initiatives between EU and non-EU Countries for Joint postgraduate courses on Aquaculture and Biotechnology. The proposed case study could fill in this gap and could act as catalyst for reproducing the initiative in other Mediterranean areas and other maritime economic activities.

[90] See: http://www.ciesm.org/

[91] See: CIESM Hydrochanges Programme http://www.ciesm.org/marine/programs/hydrochanges.htm, CIESM JellyWatch Programme http://www.ciesm.org/marine/programs/jellywatch.htm, CIESM MedGLOSS Programme http://www.ciesm.org/marine/programs/medgloss.htm, CIESM Atlas of Exotic Species in the Mediterranean http://www.ciesm.org/online/atlas/intro.htm, PartnerSHIPS: Monitoring Mediterranean surface waters with ships of opportunity http://www.ciesm.org/marine/programs/partnerships.htm, CIESM Tropical Signals Program: monitoring macrodescriptor species of climate warming http://www.ciesm.org/marine/programs/tropicalization.htm

4.9.3 Context situation

The Blue Growth Strategy of the European Commission

The EC's Blue Growth Strategy aims to improve the planning of maritime activities at sea and the management of coastal areas[92]. The aim is to establish a common European framework for maritime spatial planning and integrated coastal management in EU Member States, with a view to ensuring that the growth of maritime and coastal activities and the use of resources at sea and on coasts remain sustainable. The coherent application of maritime spatial planning and integrated coastal management should improve coordination between land- and sea-based activities. In order to further promote sustainable development of coastal zones, the Commission adopted on the 12th March 2013 a draft proposal[93] for a Directive establishing a framework for maritime spatial planning[94] and integrated coastal management. Following this, the Maritime Spatial Planning Directive[95] was adopted in 2014.

The urgent need for maritime spatial planning: a catalyst to boost investment and create jobs

Marine and coastal activities are often closely interrelated. In order to promote the sustainable use of maritime space, maritime spatial planning should take into account land-sea interactions. For this reason, maritime spatial planning can play a very useful role in determining orientations related to sustainable and integrated management of human activities at sea, preservation of the living environment, the fragility of coastal ecosystems, erosion and social and economic factors. Maritime spatial planning should aim to integrate the maritime dimension of some coastal uses or activities and their impacts and ultimately allow an integrated and strategic vision.

The uncoordinated use of coastal and maritime areas is currently resulting in competition for space and inefficient use of marine and coastal resources. The benefits of maritime spatial planning include:

- Reduction of conflicts between sectors and create synergies between different activities;
- Encourage investment – by instilling predictability, transparency and well-defined framework. This will help boost the development of marine aquaculture, establish Marine Protected Areas, and facilitate investment in the energy sector (renewable energy sources and grids, oil and gas);
- Increase coordination – between administrations in each country, through the use of a single instrument to balance the development of a range of maritime activities. This will be simpler and cheaper;
- Increase cross-border cooperation – between EU and non EU countries, on cables, pipelines, shipping lanes, wind installations, etc.;
- Protect the environment – through early identification of impact and opportunities for multiple use of space.

Maritime spatial plans can assist the development of aquaculture and blue biotechnology

In the near future, Member States will be asked to draw up maritime spatial plans, which will map existing human activities and identify their most effective future spatial development at sea, and develop integrated coastal management strategies which will ensure coordinated management of these human activities in coastal areas. They will have to fulfil minimum requirements which are of procedural nature: develop maritime spatial plans and integrated coastal management strategies, and establish appropriate cross-border cooperation among them. Aquaculture and blue

[92] See: http://ec.europa.eu/maritimeaffairs/documentation/publications/documents/blue-growth_en.pdf
[93] See: http://ec.europa.eu/environment/iczm/prop_iczm.htm
[94] See: http://ec.europa.eu/maritimeaffairs/policy/maritime_spatial_planning/index_en.htm
[95] See: Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning;
http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2014.257.01.0135.01.ENG

biotechnology will certainly benefit from this evolution as integrated marine and coastal management can boost “blue growth” opportunities in these maritime economic activities.

Eastern Mediterranean: advantages for aquaculture and blue biotechnology

The Eastern Mediterranean has competitive advantages compared to the Western Mediterranean for developing aquaculture. Not only it has an average higher temperature of 1.83 C, but it also has numerous bays, gulfs and islands as well as lagoons and saltworks that offer a competitive geophysical advantage for this activity. Aquaculture has an extremely high affinity and benefits from biotechnological improvements and applications ranging from genetics and molecular phylogenetics, to ichthyopathology and health, nutritional bioengineering (enrichment with highly unsaturated fatty acids HUFAs), chemoprophylactics and quality issues. On top of that, exploration of the sea biodiversity can help to discover and exploit bioactive compounds from marine organisms and develop new industrial enzymes or secondary metabolites with pharmacological activity or elucidation of the role of secondary metabolites in the behaviour of organisms and better understand their role in applied environmentally friendly management systems. The eastern Mediterranean's geographical position is advantageous with solar energy and, therefore, biotechnological applications for growing in mass scale algae is one more asset that can be utilised.

The Eastern Mediterranean (Adriatic, Ionian and Cyprus) is defined as composed by Sub-area 37.3 (eastern Mediterranean) and Division 37.3.1 (Aegean) of the FAO[96]. Therefore, Universities from EU and non-EU Countries could join forces and establish a **Joint Blue Biotechnology & Aquaculture postgraduate course for the Central-East Mediterranean (Blue BioTech M.Sc. programme)**. The postgraduate courses can be organised into:

1) A joint Master of Science programme, based in an EU Mediterranean Country giving also opportunities for exchange and stay in the participating EU and non-EU Countries for elective courses and the final Thesis;
2) Implementation of Summer Schools in the participating EU and non-EU Countries, with lecturers from the Universities and Institutions participating in the programme;
3) Distance Learning (Lifelong education) opportunities. This can utilise the existing IT infrastructure of the participating universities for provision of distance learning, tailor made to aquaculture and biotechnology in the East Med region. This will allow the wider dissemination of knowledge to people that due to professional commitments cannot attend the courses.

4.9.4 The purpose of the Blue BioTech M.Sc. programme

The purpose of the Blue BioTech M.Sc. programme is the training of post-graduate students in Aquaculture and Blue Biotechnology issues related to coastal and marine resources, as well as the planning of management programmes to preserve biodiversity and the sustainable exploitation of natural resources. These aims will be achieved through lectures by scientists-academics from diverse scientific disciplines, such as Hydrobiology, Marine Biology and Ecology, Environmental Economy, Marine Biotechnology and Molecular Biology as well as pharmaceutical, nutraceutical, and cosmeceutical sciences combined with natural resource management and the legislation governing their use in coastal areas. The curriculum and applications for practical training in the field will enable post-graduate students, after the completion of their studies, to have a better understanding of the opportunities for aquaculture and biotechnological applications in the East Med area and how to utilise and apply best practises in each Country (EU and non EU).

[96] See: As defined in Regulation (EC) No 216/2009 http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2009.087.01.0001.01.ENG

The Curriculum of the Blue BioTech M.Sc. programme

Postgraduate diplomas will be awarded to students that will participate in all educational and research activities, successfully pass the courses required by the curriculum and author a postgraduate dissertation. Attendance of courses and practical training is mandatory. In June of each year, the Coordinating Body assigns professors-members of the M.Sc. programme from the Universities that will participate in the programme, in accordance with their statement, the courses they will teach during the academic year that will start on September. A potential pool of additional lecturers could stem from other entities like CIESM. The titles of the courses will be announced by the Secretariat of the Lead University and will be published in the M.Sc. programme Student Prospectus/Syllabus and website.

The **Blue BioTech M.Sc. programme** consists of four six-month modules/semesters. The first semester corresponds to 30 ECTS and consists of core courses related to environmental aspects of aquaculture, the legal framework from different East Med countries, innovation and technologies in aquaculture, protected Marine Areas and Anthropogenic Impacts on Coastal Environments, biodiversity as a source of innovation and development and Marine Natural Products and Biotechnology. The core courses of the second semester correspond to 30 ECTS and are related to Fish Quality and Welfare, Marine Spatial Planning (MSP) of Aquaculture - Estimation of Carrying Capacity, Remote Sensing, Remote Monitoring and Geographical Information Systems (GIS), use of biotechnology and molecular techniques for Risk Assessment of aquatic ecosystems, Diagnostic Applications of Biotechnology and exploitation of living resources in coastal lagoons and saltworks.

The Blue BioTech M.Sc. programme gives the opportunity to students to choose one elective course (C1-C4) for completion of ECTS of second semester related to aquaculture or biotechnology issues. **Moreover, the elective courses promote student's mobility and give the opportunity to move in a country of the other collaborating universities and attend the corresponding elective courses.** Specifically, if the Lead institution will be in Greece, the semesters will be based there and the students who will choose course C1 will move to Egypt, C2 will move to Cyprus to attend the corresponding lectures whereas the students who will choose course C3 and C4 will move to Italy to attend the corresponding lectures. Each elective course is based on specific scientific background and provides specific knowledge in the area of aquaculture or blue biotechnology.

The core courses of the third semester correspond to 30 ECTS and are related to Nutrition and Feed formulation, Finfish and shellfish biotechnology, and micro and macroalgae exploitation: chemistry, bioactivity and applications. The Blue BioTech M.Sc. programme gives the opportunity to students to choose one elective course (E1-E4) for completion of ECTS of the third semester related to aquaculture or biotechnology issues. Again, the elective courses promote student's mobility and give the opportunity to move in another Country to an affiliated University or Institution, to attend the corresponding elective courses. Specifically, the students who will choose course E1 could move to Italy, for C2 must be moved to Egypt to attend the corresponding lectures whereas the students who will choose course C3 could move to Israel and for C4 could move to Jordan to attend the corresponding lectures.

The core and elective courses and their corresponding ECTS credits are tentatively defined as follows:

A. FIRST SEMESTER

Blue BioTech	Course	ECTS
A1, Core	Environmental Interactions of Aquaculture	6
A2, Core	Innovation, Technology and aquaculture production Systems	6
A3, Core	Marine Policy & Legislation, Sustainable Development & Entrepreneurship	4
A4, Core	Protected Marine Areas and Anthropogenic Impacts on Coastal Environments	4
A5, Core	Biodiversity as a source of innovation and development	4
A6, Core	Marine Natural Products and Biotechnology	6
	Sum	30

B. SECOND SEMESTER

Blue BioTech	Course	ECTS
B1, Core	Fish Quality and Welfare	4
B2, Core	Marine Spatial Planning (MSP) of Aquaculture - Estimation of Carrying Capacity	4
B3, Core	Remote Sensing, Remote Monitoring and Geographical Information Systems (GIS)	4
B4, Core	Biological Indicators of Aquatic Ecosystem and Molecular techniques for Risk Assessment in Farmed and Wild Marine Organisms	6
B5, Core	Diagnostic Applications of Biotechnology	4
B6, Core	Exploitation of living resources in coastal lagoons and saltworks	4
B7, Elective	C1 or C2 or C3 or C4	4
	Sum	30

C. ELECTIVE COURSES

Blue BioTech	Semester	Course	ECTS	Scientific Discipline
C1, Elective	B	Aquaculture value chains in East Med	4	Aquaculture
C2, Elective	B	Ecosystem-Based Management: Practical Application and Challenges	4	Aquaculture
C3, Elective	B	Biomolecular research on fish immune system and applied research on vaccine development	4	Biotechnology
C4, Elective	B	Physiological Marine Genetics: Tools and Concepts	4	Biotechnology

D. THIRD SEMESTER

Blue BioTech	Course	ECTS
D1, Core	Nutrition and Feed formulation	8
D2, Core	Finfish and shellfish biotechnology	8
D3, Core	East Mediterranean Algae: chemistry, bioactivity and applications	10
D7, Elective	E1 or E2 or E3 or E4	4
	Sum	30

E. ELECTIVE COURSES

Blue BioTech	Semester	Course	ECTS	Scientific Discipline
E1, Elective	C	Environmental Impact Assessment for Aquaculture Projects	4	Aquaculture
E2, Elective	C	Sustainable management in Mediterranean coastal lagoons: interactions among capture fisheries, aquaculture and the environment	4	Aquaculture
E3, Elective	C	Biotechnological potential of solar salt works and ecological management	4	Biotechnology
E4, Elective	C	Aquaculture: the blue biotechnology of the future?	4	Biotechnology

F. FOURTH SEMESTER

The fourth semester module is related to dissertation of students and to presentation of their Master Thesis and corresponds to 30 ECTS. Students will be able to select a domestic or foreign laboratory to carry out their dissertation, with the agreement of the corresponding professors. Students can carry out their Master Thesis on several topics ranging from molecular biology, ichthyopathology, screening of bioactive marine metabolites to management and eco-innovation. The aim is to address relationships between East Med ICZM, biodiversity exploitation, environmental friendly and sustainable aquaculture, production of microalgae and macroalgae and biotechnological applications. Indicatively, within the content of the courses described above, some indicative topics for a Thesis are listed below:

- Formulation of innovative feeding regimes for aquaculture and combination of local agricultural products as ingredients for fish feed;
- The use of ecological and oceanographic models in regional scales for estimating the carrying capacity for aquaculture development;
- Genetic and Physiological indicators for studying the impacts of environmental changes and climate change on the physiological performance of marine organisms;
- Investigation on the relationship between aquacultures, sustainability, carrying capacity and social development;
- Design biotechnological applications and environmental management in solar salt works;
- Isolation and structural identification of secondary metabolites with pharmacological activity from marine organisms;
- Isolation of marine microorganisms and chemical investigation of their secondary metabolites;
- Isolation of marine metabolites exhibiting settlement inhibition activity for the development of ecologically compatible systems;
- Chemical ecology studies aiming at the elucidation of the role of secondary metabolites in the behaviour of organisms and their utility in environmentally friendly management systems;
- Chemotaxonomical studies on Mediterranean Marine organisms;
- Investigation of the pollution impact on the chemical nature of secondary metabolites produced by marine benthic organisms and applications of them toward the development of a biomonitoring indication system;
- Enhancing pigment production from microalgae and isolation for biotechnological purposes;
- Interrelationships between coastal and marine natural resources and humans and communities;
- Use of methodological tools for understanding the relationship between the human economy and the natural environment, focusing on coastal and marine areas;
- Design of an ICZM project for a pilot site;
- Application of tools to solve selected issues arising when managing coastal and marine areas;
- Methodologies of environmental impact assessment (EIA), strategic environmental assessment (SEA) and environmental monitoring programme (EMP).

Also, students who are willing to investigate during their dissertation the entrepreneurship or the venture creation in the fields of coastal zones, environment protection, eco-innovation and quantification of biodiversity indices are encouraged to choose one of the following topics or a similar one.

- Entrepreneurship in coastal zones;
- Eco-innovative forms of entrepreneurship;
- Entrepreneurship to protect marine biodiversity;
- Eco-tourism venture creations;
- The importance of spinoffs/incubators to promote blue biotechnology entrepreneurship;
- Green-Entrepreneurship as a factor for the development of coastal zones;
- The entrepreneurial utilisation of research results on maritime protection and management;
- Clusters between Research centers and Coastal / Marine enterprises in a local area;
- Integrated Coastal Zones as areas of innovation and entrepreneurship.

The summer school of the Joint Blue Biotechnology & Aquaculture postgraduate course for the Central-East Mediterranean

The collaborating Universities and Institutions of the Joint Blue Biotechnology & Aquaculture postgraduate course may pull together experts to organise targeted summer schools on innovative aspects of aquaculture and blue biotechnology that will be addressed to the aquaculture and biotechnology industry and postgraduate students. The summer schools can be organised in the premises of the collaborating Universities and Institutions from EU and non-EU countries and will have a duration of 10 days (including a weekend).

During the course, challenges and opportunities within the area of aquaculture and/or blue biotechnology will be discussed, tailor made for East Med. 15-20 lecturers from the hosting university and the collaborating one's will contribute to the course. The objective of the Summer School is to gather an international group of selected postgraduate students of different disciplinary backgrounds around selected topics of Aquaculture and Blue Biotechnology. Through lectures from distinguished scientists within the field, attendees will be presented with tools to address challenges and specific problems within different aspects of the selected topics. The attendees will be provided multiple opportunities to interact with invited scientists and learn from each other and build networks which will be of benefit in the future.

As part of the course assignments, each student can present a poster describing the most important aquaculture and/or blue biotechnology issues of today and for the future based on their own research and geographical area perspective. The language of instruction will be English. The summer school will be addressed to post-graduate students associated with the collaborating universities, whose research is directly related to some aspect of aquaculture and blue biotechnology as well as to employees of companies related to the above areas. Preference could be given to PhD students. In the absence of suitable PhD candidates, universities may put forward final year Masters students or Junior scientists/instructors, if their research interests are in line with the topic. Candidates will be invited after selection to participate in the Summer School. It is envisaged that a maximum of 25 participants will attend (Course credits: 5 ECTS). There will be a Course fee to cover accommodation, local travel, and meals for international students.

Structure and outline of the Summer School

The summer school may have the following structure: first, discipline-specific lectures to create a common knowledge base as a starting point; second, more interactive and interdisciplinary lectures and case studies on key commodities of East Med (e.g. water and feed resources including infrastructure); and third, activities about best practises transfer from one Country to another.

Before the course start, during May and June, students will be required to complete the reading of background papers (to be sent out in April) to ensure that all participants have a basic knowledge and will be able to fully benefit from the course. Each student is also required to prepare in advance a poster describing, based on their own subject area perspective (e.g. for aquaculture it could be reproduction, genetics, feed and nutrition, health and welfare, fish quality and human nutrition, economics etc) and geographical area perspective, the most important aquaculture issues of today and for the future. The posters should describe the most common aquaculture species and production system in the students own region, and the challenges and opportunities linked to these species and systems. The posters are presented during the first three days in connection to lectures on the different disciplines. The posters will form the basis for the discussions following each lecture block. Group work will be conducted in both within-disciplinary and multi-disciplinary settings. Each summer, two courses could be implemented: one focusing on aquaculture and one focusing on blue-biotechnology. Indicative focused sessions could include:

- Environmental biotechnology through marine microbial knowledge;
- Natural products based on marine biodiversity and strategies for high throughput isolation of novel marine microorganisms;
- New species development for aquaculture: challenges and solutions;
- Why are my fish sick? Common themes behind diverse problems in aquatic animal health and how to prevent them.

The Distance Learning (Lifelong education) opportunities of the Joint Blue Biotechnology & Aquaculture postgraduate course for the Central-East Mediterranean

The existing IT infrastructure of the participating Universities for provision of distance learning, tailor made to aquaculture and biotechnology in the East Med region can be used for those wishing to get started down a blue biotechnology or aquaculture career path without any prior biology or biotechnology experience and may want to consider pursuing such a certificate degree programme. These certificates can be obtained through continuing education distance learning programmes and can be achieved in a relatively short time. When earned through an accredited programme, these certificates may be sufficient for the holder to earn a job as a laboratory or research technician or as technical personnel in an aquaculture enterprise. Those with higher aspirations in biotechnology may consider an associate's degree that will provide additional research skills and technical knowledge. Computer based education is designed to provide total access in higher education to more citizens for both graduate and post-graduate level. Knowledge, new technology, innovations and ICT services can be effectively diffused in the East Med with the implementation of various programmes for distance education, remote seminars, professional training, corporate training and the support of new professional horizons for graduates.

4.9.5 Conclusions and recommendations

The above offer can provide an important boost to the development of sustainable aquaculture practices in the East Med, and have these innovate through blue biotechnology. The course is expected to provide an important step towards the creation of knowledge and competences in this field, and contribute towards the creation of high-quality jobs in the field.

Nevertheless, and building on previous experiences in assessing such joint Master's programmes under the Erasmus Mundus programme, it is important to take into account certain lessons when n setting up such a scheme.

- It would be useful to make links with the AQUAT-NET project (or its initiators, as the project has come to an end in its current form), which was set up specifically to promote cooperation in education in Europe;
- A joint Master's programme will be more successful in case of existing trust and cooperation among the institutes and persons involved; if these links are yet to be developed, it is important to take some time to better understand each other's strengths and interests, and invest in cooperation and networking;
- A joint Master's programme can be more feasible if the number of partners involved is limited; if interest to cooperate is wider, one can consider to elaborate the programme with a number of core partners and extend it to other institutes;
- The sustainability of the programme will depend amongst others on the ability to charge cost-based tuition fees; however the ability of students to pay such fees is expected to differ across the region, hence a policy needs to be set up on how to address this differentiation (e.g. scholarships, reduced tuition fees, etc.).
- All elements of the programme need to meet quality standards, and it should be prevented that the reputation of the programme is compromised by particular weak modules.
- The Erasmus + programme appears to be a suitable vehicle for developing such a programme.
- Sufficient attention will need to be paid to the marketing of the programme in the region, e.g. through dedicated channels, professional organisations, conferences, websites, etc.
- It is important to preserve and build the momentum of the initiators and agree on precise timelines and milestones needed for its development and implementation.

4.10 The Mediterranean Forum for Maritime Education and Training

4.10.1 Introduction and objective

On 22 January 2016, experts gathered in Genoa (Italy) to discuss the potential for international cooperation in the areas of maritime education and training in the Mediterranean sea basin. Specific attention has been given to three specific sectors: maritime security, maritime safety and the protection of the marine environment.

The following key messages emerged during the meeting, which constitute the basis for the forum proposal:

- Almost every Maritime Economic Activity has a security-safety component. To recognise this means tackling security and safety issues in a comprehensive manner, embedding them in other maritime sectors and relevant activities;
- The responsibility for the provision of education and training in the maritime sector, including security and safety, can vary greatly depending on the country. It can be provided by public or private organisations, being more focused on higher education or, conversely, focusing on vocational education and training;

- Differences in how countries organise and distribute competencies and responsibilities call for innovative cooperation solutions. Potential benefit can be reached in the form of collaborations where resources and expertise can be pulled together to benefit participants.

We propose to dedicate this case study to exploring the concept as well as the possible set-up of a **Mediterranean Forum for Maritime Education and Training.** We wish to do so by following a systematic approach which comprises the following elements: we will present the conceptual elements pinpointing the idea of a Forum as they emerged during the Genoa focus group. Then, we will present the characteristics of two networking projects: this will allow us to observe how other networks of cooperation have been structured and what their benefits and challenges are. Additionally, this step will ensure that our proposal for a new Forum represents an innovative element in terms of scope, organisation and ability to overcome certain barriers (organizational, financial, etc..).

After having looked at similar experiences, we will look into the funding elements and characteristics that we believe the Forum should bare. The details of the Forum's objectives, governance structure as well as sustainability mechanisms will be presented in this section, together with an indication of the level at which the European Commission could act. Finally, the last section compiles a list of actions to be elaborated and prioritised to ensure the successful set-up and functioning of the network.

4.10.2Existing initiatives

The European Coast Guard Functions Academy Network project

The European Coast Guard Functions Academy Network project (ECGFA NET) has been launched under the auspices of the European Coast Guard Functions Forum (ECGFF) with the support of EU funding (EMFF). Since 2009, the ECGFF brings together **Coast Guard Authorities of EU Member States as well as Schengen Associated Countries**. In its plenary conference, the Forum has discussed approaches to tackle shared challenges in areas such as maritime security, maritime safety, border control, search and rescue, marine environmental protection and other relevant maritime issues. In the course of its meetings, the Forum identified the need to enhance training related cooperation, harmonise training systems and increase interoperability as well as. In this context, the Forum's Plenary Conference mandated to start a ECGFA NET project, which aimed at the establishment of a Network of Coast Guard Functions training academies as well as at starting the work on the development of the European Coast Guard Functions Sectoral Qualifications Framework (CGFSQF).

Implemented form January 2015 until February 2016, the ECGFA NET project is a joint effort of a number of European Coast Guard functions agencies. Whilst the Finnish Border Guard is acting as a beneficiary and a coordinator in the ECGFA Net project, the Spanish Maritime Agency SASEMAR is responsible for the construction of the Training Portal and Italian Coast Guard for the CGFSQF work. 13 agencies are among the contributors / affiliated entities[97].

[97] Italian Coast Guard, Armed Forces of Malta, DGDDI - French Customs, Romanian Naval Academy of Constanta, Guardia Civil (Spain), Portugal - Guarda Nacional Republican, German Federal Police, UK Maritime and Coastguard Agency, Hellenic Coast Guard, Spanish Customs and Excises, SASEMAR (Spain), Cyprus Police Academy, Spanish Navy. Other organisations have an observer status. These are: European Space Agency, Guardia di Finanza (Italy), European Fisheries Control Agency, Frontex, European Union Satellite Centre, Swedish Coast Guard, The European Police College (CEPOL).

The project's main result are as follows:

- Establishment of a new training and education related cooperation framework under the ECGFF: **The European Coast Guard Functions Training Network** (ECGF Training Network);
- Construction of an **ECGF Training Portal** where ECGF Training Network members can exchange information, for example; on training courses that are open to participants from other members of the network. Spanish SASEMAR was responsible for this;
- Definition of the basic elements, key recommendations and methodology for the further development of the **Coast Guard Functions Sectorial Qualifications Framework** (CGFSQF). Italian Coast Guard has been responsible for this;
- Development of recommendations on an **ECGF Exchange Programme** as well as general training recommendations for EU and 3rd countries. Amongst the recommendations on cooperation with 3rd countries there was suggestion to prioritise the strengthening of links and cooperation amongst the Network's members, before soughing at expanding membership to, for instance, third countries notably beyond EU borders.

Administration and Coordination of the ECGF Training Network

ECGF Training Network had 18 signatories / members by the end of the ECGFA NET project (February 2016), while other members are expected to join in the near future.

The Network's normative base is a **Statement of Intent** document, establishing a "voluntary association of educational institutions providing education in the field of coast guard functions in the member states of the European Coast Guard Functions".

Additionally, the Statement of Intent provides the main elements determining the ECGF Training Network :

- Guiding principles;
- Membership;
- Tasks of Members;
- Governance;
- Resources;
- Amendment and modification of the Statement itself.

The Statement of Intent establishes the creation of a Governing Board to oversee the work of the ECGF Training Network.

Sustainability and EU Added Value

The European Union (EMFF) ensured 80% of the project's funding, while the remaining 20% was ensured by the Network's funding members. The below follow-up actions are currently being planned with the support of EU funding, including:

- Support the ECGF Training Network during its ongoing start-up phase in order to enable the Network to function in the long term without the support of the project;
- Pilot the first ECGF Exchange Programme;
- Develop the European Coast Guard Functions Sectoral Qualifications Framework.

According to representatives of the Finnish Border Guard who acted as a coordinator in the ECGFA NET project, EU funding was crucial to making the project happen. Also, DG MARE and several EU agencies provided support in terms of advice, while representatives of DG MARE sat in the executive board of the project to provide general guidance and monitoring.

In conclusion, the ECGFA NET project contributed to highlighting that:

- Access to a secure source of financing can have an impact on the nature, depth, duration, success and membership of a network. It is therefore of crucial importance to carefully consider ways to ensure the sustainability of cooperation;
- An ad hoc project can support the establishment of a new network, promote buy-in among the intended members and stakeholders, while also allowing to carefully plan preparatory work. In the case of the ECGF Network, the support of the European Commission has been the final enabler for the project to be implemented;
- Although it might require intense negotiations, a formal agreement among participating organisations and/or countries can ensure that participants share the same vision and objectives, and that they all agree on the rules and practices they will need to respect;

MariFuture

MariFuture – the *European Platform for Maritime Education, Research and Innovation* - is a partnership of maritime education and training (MET) institutions, industry stakeholders and decision makers from across Europe whose aim is to identify education and training needs of the maritime industry, while providing solutions to these needs. Its sectorial focus is the shipping industry, although it remains open to other maritime activities. One could say that MariFuture has an inclusive nature, as different maritime industrial sectors (such as ship operators, shipbuilders, and support industries) are represented.

Main aims of MariFuture are:

- Facilitating synergy between stakeholders in the maritime industry through the creation of new collaborative partnerships;
- Identifying the education and training requirements of the sector through extensive research and consultation involving stakeholders from all areas of the maritime transport sector;
- Encouraging the development of novel and innovative technology and methodologies which make full use of knowledge collated within partnerships.

One of the main actions carried out by the platform is the promotion of and support to the creation of collaborative partnerships involving universities, research centres, businesses, and stakeholders from all areas of the maritime transport sector. Members have links to well-known maritime and shipping conferences and associations worldwide. MariFuture's vision is to improve the standards and meet the industry needs through innovation in education and training as well as in research and development.

As non-profit private organisation, MariFuture's mission is also to serve as catalyst and creator of synergies among its members to facilitate the creation of partnerships with a view to gain access to EU as well as other international funding opportunities. For this reason, part of the activities carried out includes the monitoring of funding opportunities. In the past years, it became apparent that the participation of Marifuture's members to various European and international projects had contributed to the creation of considerable know-how in the maritime and shipping sector. MariFuture capitalises on such knowledge and makes it available for the benefit of future collaboration opportunities. Some projects are initiated by a partner depending on their organisation's needs (hence a push initiative) or through a 'pull' initiative, i.e. when there is new legislation or a deficiency.

Another part of MariFuture activities focuses on the development of education and VET courses as a response to MET needs. This is done through working in conjunction with major international awarding, accrediting and licensing bodies to ensure its MET programmes/courses are accredited and receive international recognition. This has been an extremely important consideration to ensure MariFuture's sustainability. The Platform ensures its programmes/courses satisfy IMO (International

Maritime Organisation) rules and legislations and that these are in line with the EU's frameworks for qualifications and credit transfer schemes (ECTS and ECVET).

Membership and Network

The MariFuture platform can be seen as an "activator of networks" in the sense that it brings together organisations which are part of existing collaboration structures and EU-funded projects such as SOS, MarTEL, EGMDSS, SURPASS, and MAIDER, and EBDIG. In addition to partners in the Platform, a number of actors have joined as associated organisations including major shipping, port companies and port associations. The key partners supporting MariFuture often collaborate with the International Maritime Organisation, to update current mandatory and non-mandatory requirements and courses. An example is the recent work carried out to update the IMO Maritime English Model Course 3.17 which aims at developing maritime English learning and assessment frameworks, now is now supported by the EU funded SeaTALK platform[98], its associated networks[99] and linked to the new EU funded MariLANG project[100].

Administration and Coordination

General coordination of the MariFuture network is ensured by the London-based Centre for Factories of the Future (C4FF). To allow for the exchange of ideas, C4FF makes available a so-called 'innovation platform', that also includes a voting system (http://comeupwithagreatidea.com/) through which ideas are brought forward and partnerships are built. Social media are also used to seek comments and feedback on any identified problem/deficiency or any future projects. LinkedIn in particular is very active and a good source for evaluating partners' ideas.

Articles and development papers are periodically published on the MariFuture website. Development papers are generally 'future oriented', in the sense that they tend to raise issues or highlight specific needs, while making concrete proposals for future solutions. A newsletter is also published on a monthly basis, providing members and the general public with an overview of progress regarding projects where MariFuture members are participating. On top of this, tender opportunities as result of the mapping activities carried out by C4FF and eventually MariFuture members are published on the website.

Sustainability and EU added value

MariFuture's existence has so far been based on the MET consultancies provided by the network - which also support preparation of new national (UK) and EU-funded project proposals. As for the development of learning packages, this activity also represents a source of income to the platform. When asked about the potential role of the EU to promote MariFuture, representatives of the network indicated that EU funding could help increase the visibility and further structuring of the Forum's activities also by financing a representation desk in Brussels.

Conclusions

All in all, MariFuture represents a successful example of a project-based network which successfully managed to ensure its sustainability through private funding. To do so, it opened itself up to consultancy activities as well as to the development of ad hoc learning packages which respond to higher as well as VET education needs notably in the shipping industry. In this sense, its "commercial' rationale differs to the aim of a potential Mediterranean Forum which will be presented later. Yet, the system in place ensuring decision-making as well as the sharing of information and communication among members as well as towards the general public is extremely interesting. What also emerges is the need to identify and contract an entity ensuring the daily management of

[98] www.seatalk.pro
[99] such as www.martel.pro
[100] http://www.marilang.eu/

the network, which eventually can step up its role and serve as mediator among different interests and directions.

Result Analysis

The above initiatives provide useful examples of cooperation involving a variety of stakeholders from different countries. In particular, the ECGFA Network example highlights the critical importance of developing and agreeing a normative basis for cooperation. It also points to the added value of the EU in financing a preparatory study which led to the establishment of a proper network. In this case however, the Network's membership is limited mainly to European Coast Guard agencies which expectedly carry out similar ranges of activities and might well face shared challenges. In this sense, membership is not 'open' to a variety of stakeholder categories and is not fit to embrace the governance differences across actors involved in MET. In the MariFuture case we also notice how the issue of sustainability can have an impact on the mission of the network itself.

One could also note that the scope of the two observed cooperation initiatives goes beyond the whole Mediterranean sea basin. The desk-based research carried out for this study (Chapter 2) has already pointed to a lack of transnational initiatives between EU and non-EU countries for tackling MET. The remainder of this case study aims at providing a few innovative ideas for the establishment of a Mediterranean platform, which could fill in this gap while acting as catalyst for enhancing cooperation in the MET field.

4.10.3The rationale for a Mediterranean Forum for Maritime Education and Training

The elements below have been developed with the aim of making a case for the creation of the "Mediterranean Forum for Maritime Education and Training". They point to needs that, as far as possible, the Forum should address for the benefit of its members. First and foremost, the Forum is an attempt to suggest a concrete frame for reinforcing cooperation between countries which have been facing similar challenges that could be addressed jointly. Secondly, the Forum could contribute to addressing the issue of skills mismatch by encouraging exchanges and the identification of common practical solutions.

The need for enhanced cooperation across the Mediterranean Sea basin in the area of MET

Since the Limassol Declaration, growth and jobs have been put at the core of fundamental initiatives such as Blue Growth and the Integrated Maritime Policy (IMP). In 2010, the latter was extended to the EU neighbouring countries to promote an integrated approach to maritime affairs to maximise the use of the sea whilst maintaining a viable sustainable environment. In this context, several meetings and workshops for relevant Ministries and public bodies were organised to discuss and agree on common priority areas for intervention. In the context of the 12th FEMIP Conference dedicated to the blue economy and to marine and maritime cooperation, participants from the EC, EIB as well as IMP countries indicated the need to establish a network providing exchange and cooperation opportunities, matchmaking activities as well as the general attractiveness of blue careers. It is therefore crucial to capitalise on the current political momentum which ensures that cooperation in the area of MET is high on the political agenda of IMP countries.

The analysis conducted so far in the context of our project has highlighted the overall willingness among contacted stakeholders and decision-makers to engage in collaboration opportunities, notably when it comes to education and training. Yet, the study indicated that just under half of the cooperation initiatives mapped are intra-Mediterranean.

The mismatch of skills

Overall, those stakeholders who were contacted during the different phases of the project agreed in pointing to a mismatch between offer of skills and demand of the market. Agreement is however only apparent since substantially different perspectives were highlighted by stakeholders depending on their location (i.e. sub-sea basin level) and by stakeholder category (private, public and MET stakeholders). The most striking dissimilarities concerned the Maritime Economic Activities which were pointed as suffering from a mismatch, thus making it difficult to prioritise between for instance innovative and traditional maritime activities.

4.10.4 Potential Features of the Mediterranean Forum for MET

Mission and characteristics

The overall aim of the Forum would be to provide a platform where different stakeholders meet and discuss to collectively identify common education and training needs, as well as efficient and effective solutions to meet such needs. This relatively wide scope of action would preserve and reinforce existing collaboration ties, which often transcend the sub-regional dimension. Participation to the Forum would be open to public and private education and training institutions, policy makers, the maritime industry as well as existing networks of cooperation which have a maritime education and training focus or component.

More concretely, the Forum would positively contribute to addressing the following issues:

1) Contribute to the development of concrete collaboration opportunities between and among EU and non-EU countries;
2) Create an environment of trust and collaboration among participants;
3) Facilitate the exchange of ideas, experiences and practices;
4) Bring together public and private stakeholders from the education and VET world;
5) Encourage the identification of the needs of individual organisations and existing networks in terms of courses, teaching material, infrastructure, etc.;
6) Promote the sharing of experiences as well as the development of shared solutions to concretely tackle common needs;
7) Provide concrete responses to the mismatch of skills between education & training and the maritime industry.

We believe that this **degree of flexibility** (notably in terms of categories of participants) is needed in order to recognise the varied nature of MET in each EU and non-EU country. By doing so, we would ensure that the Forum mirrors the varied national landscapes in terms of responsibilities, governance and actors that are in charge of MET in the countries.

Sectorial and geographical focus

As far as sectorial specialisation is concerned, **all Maritime Economic Activities could potentially be covered by the Forum's activities**. This choice would have the advantage of recognising the frequent cross-sectorial nature of maritime activities, as well as the synergies that can occur within maritime value chains. Alternatively, a case could also be made to have the Forum focus on a few MEAs, e.g. the most innovative one's in the Blue Economy or those who suffer the most from a skills shortage. The latter option, however, would have the risk of shortlisting MEAs that are considered crucial by certain participating countries only, thus discouraging other countries with different MEA needs and characteristics.

In terms of geographical scope, participants of the Genoa focus group indicated that **the Mediterranean region is the appropriate level where international cooperation could occur**. The main reason for this is because several focus group participants have established collaborations (often project-based) with actors that are not necessarily located in the same sub-

sea basin. Indeed, collaboration at the Mediterranean level could have the advantage of facilitating links between and among EU and non-EU countries, as well as across sub-sea basins. Nevertheless, the flexibility of the Forum's structure could occur at times along the lines of geographical sub-sea basins, or depending on the sectorial focus of the sub-committees (see section below).

The Forum's Structure

This section provides a few ideas on how the Forum could be structured so to ensure a well-functioning multi-level and effective governance. It should be stressed that **the below structural elements are to be intended as mere suggestions** which would benefit from a more throughout reflection, also on the basis of the feedback from the validation workshop.

High Level Group

As the governing body of the Mediterranean Forum, it is responsible for developing and implementing **the Memorandum of Understanding** (MoU) which will constitute the founding document regulating the Forum's governance, membership and overall objectives. A few suggestions can be made at this stage:

- The MoU needs to clearly indicate the objectives of the Forum, namely the development of specific professional skills as well as the agreement on the methods of certification through which such skills will be recognised by the Forum's members;
- The High Level Group should reflect the varied nature of its members, thus including representatives from the High Education, VET as well as national government officials;
- The European Commission could have an observatory role, hence monitoring and facilitating negotiations for the signature of the MoU;
- The MoU should establish the frame and rules within which the Forum will operate. These include membership, governance, financing and overall objectives. Rules regarding the presidency and the related voting rules should also be clearly indicated.

The Secretariat

It coordinates all the work in the Forum and provides the secretarial support. A call for proposals could be launched by the European Union to subcontract such role to one external organisation, which would ensure the appropriate independence and managerial skills to facilitate exchanges and ensure that the MoU is properly implemented. Alternatively, secretariat functions could be ensured by the country ensuring the Forum's presidency.

The secretariat would be in charge of the day-to-day management of the Forum and coordination of the Forum's activities and periodical meetings. To do so, part of the financial resources directed to the Forum would need to be devoted to administration and management.

The Industrial Group

Composed by members of the maritime industry, it would have a consulting role to steer and oversee the identification and update of those skills mentioned in the Memorandum of Understanding. Certainly, the development of skills needs to mirror the strategic present and future needs of the maritime industry in terms of competencies. Members of this group could be national chambers of Commerce, as well as the main European and non-European trade unions.

At national level, Chambers of Commerce as well as trade unions would be encouraged to consult with their individual members regarding their needs in terms of sectorial skills. We would discourage the direct participation of individual industrial stakeholders, as certain countries would be overrepresented and thus influence the outcome of discussions towards skills that might not be crucial for the overall sector.

National/Regional Groups

National and Regional Groups would be set up at national level to facilitate early exchanges as well as the fine-tuning of national positions vis-à-vis MET needs in specific industrial sectors and areas. They would be responsible for collecting needs and ideas emerging in MET, making sure that at least one national member (for VET and/or higher education) sits in each of the Working Groups (see below). The creation as well as the establishment of these National/Regional groups would be managed by each participating country. Eventually, the organisation running the secretariat of the Forum could be charged of designing a 'template' for establishing national MoUs.

Working Groups

Working Groups would represent the 'living and evolving' assemblies of the Forum. Each Working Group (WG) would correspond to a specific Maritime Economic Activity. Additional ad hoc Working Groups could be set up to facilitate exchanges and identify needs on specific cross-sectorial issues, such as security and safety of maritime personnel, marine and maritime pollution, maritime infrastructure, etc…Each WG could bring together representatives of those institutions and organisations that are in charge of delivering MET at their level of responsibility (national regional, European, etc..). WG would also be attended by at least one member of the High Level Group as well as by the Industry Group, which would preferably be given an observatory role only.

To a certain extent, Working Groups might not necessarily be reflecting the whole Mediterranean spectrum. For instance, certain skills shortages or MET needs might be more prominent in certain sub-sea basins or between EU or non-EU countries only. In this sense, **Working Groups would express the flexible nature of the Forum** by adapting membership to the needs of certain geographical areas or group of countries. For instance, they would encourage regional cooperation among non-EU countries in the Adriatic-Ionian as well as in the southern neighbouring countries.

The most important element would be the solution-oriented nature of such gatherings, so to meet two fundamental objectives: participating organisations and institutions gather to exchange views on the needs of a particular sector; however, the exchanges would also need to focus on bringing forward solutions and possibly allocating responsibilities among those organisations willing to provide practical help.

Sustainability and EU added value

The results emerged so far in the context of this study indicated that one of the reasons why 'project-based' networks of cooperation cease their activities is the lack of financial resources to ensure their long-term sustainability. This observation suggests that, should a network such as the Forum be put in place, its resources should be ensured independently from the availability of support from a specific donor like the European Union. As a consequence, a membership system should be put in place, including a transparent method for the collection of participation fees. These could be made mandatory at country level or, eventually, at organisational level. Nevertheless, the setting of the fee amount might have an impact on the type and number of individual organisations willing to participate to the Forum.

Fees could cover:

5) The right to be part of the National/Regional Working Groups, which represent the necessary intermediate membership to access the Forum's Working Groups at Mediterranean level;
6) The contracting and running of secretarial and organisational support;
7) The maintenance of the Forum's website;

8) The holding of Working Group meetings and any other ad hoc meeting that participants wished to hold. This could also include the coverage of travel and accommodation of participants;

Fees should however not cover the availability of meeting facilities, which should be made available – as far as possible – by those organisations participating to concrete activities addressing MET needs. By doing so, a systematic link would be created between accessing participation benefits and **ensuring the necessary commitment of participants**.

As far as a potential involvement of the European Commission is concerned, this could consist of financing an exploratory project to assess the feasibility as well as the detailed characteristics of the Forum. In addition to this, there seems to be a case for keeping the secretariat function separated from the membership of the Forum. In this sense, the European Commission could be responsible for the tendering of the secretariat/organisational support, including its direct contracting and resourcing. By doing so, the European Commission would be able to ensure that the necessary support is ensured to the Forum, while avoiding that any individual interest strives the process or influences the Forum's daily functioning.

Moreover, we see much added value in having the European Commission steering the process which will eventually lead to the signature of a Memorandum of Understanding among the participating countries. The European Commission is in fact the linking dot between and across several EU level as well as extra European regional and international for a and thus occupies a privileged position when it comes to prompting participation as well as ensuring coherence and synergies between different initiatives.

4.10.5Conclusions and recommendations

Below we make a few suggestions on the actions that, in our view, are required to ensure the setting-up as well as the sustainability of the Forum:

7) Ensure political support to the initiative among EC, EIB and IMP participating countries. The backing of those countries who firstly raised the need for enhanced and structured networking opportunities is a *conditio sine qua non*. Countries bordering the Mediterranean basin would need to engage themselves in the facilitation of both cooperation and coordination of facilities;
8) Clear commitment would have to be secured among those countries which would benefit from but also give support to the Forum, namely the countries active in the IMP-MED programme;
9) Steer a process which would aim at agreeing on a Memorandum of Understanding which would establish the Forum's objectives, a transparent and fair method for the collection of participation fees (as well as the level at which these should be collected), the Forum's governance as well as a list of indicative MET tools which could be used for training purposes. The MoU could also include a set of rules and guidelines to ensure that practical solutions to MET needs are not only proposed, but also implemented. Finally, a proper evaluation and feedback mechanism should be put in place to ensure that the Forum meets the objectives included in the Memorandum of Understanding as well as in the Terms of Reference for secretarial and organisational support;
10) Develop Terms of Reference for a feasibility study which would look into the characteristics and operational needs of the Forum. It is at this stage that the geographical as well as sectorial scope of the Forum should also be defined;
11) Gather the necessary experts and interest representatives to develop a coherent, forward-looking list of skills needed to ensure the development and sustainability of the blue economy in the Mediterranean sea basin. A balance would need to be reached between industrial interests and the feasibility of actions needed from the MET side to meet such needs;

12) Develop terms of reference to ensure the Forum is assisted on a daily basis through secretarial as well as organisational activities. The contractor/member organisation in charge of supporting the Forum would need to be made responsible of the following activities:
    a) Organisation of physical meetings to support the operational creation of solutions to the participants' needs (technical assistance, event organisation);
    b) Support to the moderation of WG gatherings;
    c) Provision of competent, up-to-date and needs-based advice in support to the realisation of the objectives indicated in the MoU, notably regarding skills and recognition of qualifications;
    d) Development and creation of an external website to promote the involvement of stakeholders;
    e) Set-up a virtual forum for stakeholders to identify needs and potential solutions before the holding of Working Groups;
    f) Hosting, within the Forum's website, of a "Virtual Knowledge Centre" on Maritime Education and Training allowing for the sharing of relevant available general, technical and sectorial information in the region;
    g) Ensuring the visibility of the Forum through the regular publication of newsletters presenting the activities of the Forum, including an events' calendar.

Annex 9: Minutes of the Validation Workshop

EUROPEAN COMMISSION
Directorate-General for Maritime affairs and Fisheries

Maritime policy Mediterranean and Black Sea

Validation Workshop

In the context of the « Study supporting a possible network of maritime training academies and institutes in the Mediterranean sea-basin »

22nd April 2016 (10.00-16.30)

Headquarters of the Italian Corps of the Harbour Masters & Coast Guard
Rome, Italy

Welcome address: Captain Enrico Castioni, Head of International Affairs Office of the Italian Coast Guard Headquarters, welcomed participants at the premises of the Italian Coast Guard Headquarters. Captain Castioni provided an overview of the Italian Coast Guard's mission and duties, while confirming the organisation's commitment in fostering training cooperation as key factor for implementing integrated maritime policies and promoting interoperability amongst coast guard authorities.

Mr Marco Nobile, representing the Directorate General for Maritime Affairs and Fisheries of the European Commission, provided an overview of the study commissioned by the European Commission. Also, he informed the audience that the issue of maritime networking and skills will be embedded in the exchanges of the Blue Economy Working Group on 17th May 2016, back-to-back with the European Maritime Days in Turku, Finland. Mr Nobile added that the European Commission is currently drafting its Work Plan for 2017, and considering to finance a pilot project on maritime training. Referring to the role of the Union for the Mediterranean, Mr Nobile stressed that the organisation is in charge of the follow-up to the Declaration for the Promotion of the Blue Economy in the Mediterranean Region of the Ministers and other Heads of Delegation, who gathered in Brussels on 17 November 2015, under the Union for the Mediterranean (UfM) banner.

Key findings of the study

As moderator of the meeting, Mr de Vet presented the study commissioned by DG MARE, its goals and main findings. He also introduced the main principles for future support which emerged in the previous phases of the project, while inviting participants to discuss and validate the main principles forming the 'passage plan' for creating and reinforcing maritime education and training networks. To complete the picture Mr Javier Fernandez from Ecorys España presented the drivers, benefits and barriers to cooperation identified throughout the project.

Mr Sciacca from the CRPM (Conference of the Peripheral Maritime Regions) indicated that one of the lessons learned from implementing the Vasco de Game project was that financial resources are not the main barrier to cooperation. Financial sustainability becomes a major element when follow-up initiatives and eventual spin-offs are considered. Instead, CRPM stressed the importance of

considering differences between the applicability of projects and their replicability. While it can be easy to disseminate the methods used to obtain mainstream results in policies, replicability may sometimes be challenging. For these reasons, particular attention and resources should be devoted to **ensuring the actual implementation of initiatives and projects**. However, one should carefully acknowledge the difference between competition and cooperation. Since education and training institutions often compete to deliver high education and training courses and standards, harmonisation of study content, modules and programs can be complex. On the other hand, cooperation can occur more easily through the promotion of, for instance, the student and professor exchanges across universities that offer similar study modules. For such reasons, the Vasco de Gama project aimed at firstly promoting coordination, which would eventually be followed by harmonisation initiatives.

The need for ad hoc trainings on innovative technologies was pointed out by Mr Zammit of the Tunisian Mediterranean Institute of Maritime Training. Key international institutions such as the International Maritime Organisation (IMO) are fostering exchanges among international partners on ways to **accelerate capacity building and technology transfer in the maritime field**. Integrated methods and common approaches could be useful to overcome financial barriers which often accompany the development and use of new technologies.

Session I: Testimonies from initiatives identified

VET on Board – Maritime nautical training in Barcelona

Mr Pere Maria Ros Vidal of the Fundació BCN Formació Professional introduced the project Vocational Training on Board 2013-2016 in Maritime nautical training in Barcelona. The Vocational Training Foundation of Barcelona develops collaborative projects between stakeholders involved in vocational training. It aims at launching projects that ensure **up-to-date vocational training standards, meeting the needs of the industry**. To do so, the Fundació BCN Formació Professional has set up a training route including 350 to 400 hours of training. Financial incentives are then put in place to ensure cadets are integrated into the labour market.

Malta Marittima

Mr Vince Maione of the Malta College of Arts, Science and Technology introduced Malta Marittima, a recently created agency building on the outcomes of the Malta Integrated Maritime Policy to **bring industry and government stakeholders together** so as to focus and promote the continued and enhanced development of the marine and maritime industries in the Maltese Islands. Initiatives focus around four areas: 1) an integrated sectoral approach across all key maritime sectors (logistics, commercial, services, food and energy); 2) education and research; 3) safety and surveillance and 4) development of clusters as a way to bring the business and non-business members together.

Vasco de Gama

Mr Giuseppe Sciacca of CRPM presented the Vasco de Gama project. Started in 2013 in the frame of the EC Maritime Transport Strategy, the Vasco de Gama project aimed at **promoting the quality of training and education in maritime transport, enhancing the mobility of students and improving networking among different types of actors** (universities, private sectors and regions). Among its concrete deliverables, the project established a master programme for post-graduate students, created a summer school and more generally contributed to the establishment of a ‘maritime community’ of actors.

Mr Maione listed two key challenges faced by Malta: on the one side, the need to identify qualified staff to be employed in specific areas; on the other side, the increasing difficulty to place sea cadets

on the job market. Indeed, elements of solutions could be brought by **enhancing collaboration between institutions, supporting the creation of networking structures and promoting internationalisation initiatives.**

Another major challenge such as the lack of professional trainers was identified by Mr Walid Kamali from the Lebanon Al-Manar University of Tripoli. There is an opportunity in attracting retired sea professionals to teach students, although language as well as salary barriers can exist. Mr Zacharias Siokouros of the Cyprus Maritime Institute of Eastern Mediterranean highlighted the **importance to engage with the maritime industry.** Firstly, because the industry has staff with practical knowledge and expertise; secondly, to engage them in addressing the skills mismatch and eventually increasing the chances for cadets to be recruited by the industry.

Mr Mavromoustakos of the Cyprus Maritime Academy highlighted the **need for a common qualifications framework for VET and higher education** across Europe. As a starting point, countries need to develop a common and clear understanding of the different EU as well as national qualification framework systems. With no doubt, the maritime industry would benefit from such a harmonised approach. The ESCO initiative (European Skills, Competences, Qualifications and Occupations), launched by the EU with a view to harmonise qualifications, is a positive start that could benefit from a stronger maritime and possibly blue economy component.

According to Mr Marco Nobile from DG MARE, one significant challenge regarding qualifications is to **reach an agreement on the levels of skills for new jobs in the Blue Economy** (e.g. aquaculture, fisheries, nautical tourism, transport activities not covered by IMO legislation). These activities are true drivers for innovation but require the development of tailored competences and skills. However for cooperation to successfully occur in the Mediterranean sea-basin, the strong basis established by the UfM Declaration for the Promotion of the Blue Economy in the Mediterranean region should be supported by ad-hoc funding open to both EU and non-EU countries.

Session II: Addressing maritime education and training needs through new initiatives

Blue Career Centre for the Eastern Mediterranean

Mr Zacharias Siokouros (Maritime Institute of Eastern Mediterranean) and Captain Ahmed M. Youssef Taha (Arab Academy for Science, Technology and Maritime Transport) presented the rationale and objectives of a proposed Blue Career Centre for the Eastern Mediterranean. The Blue Career Centre seeks to **provide prospects for young jobseekers** in the maritime economy in the Eastern Mediterranean, and to **support businesses in finding the right staff** with proper qualifications. Initiated by a group of leading education and training professionals and business representatives, the Blue Career Centre will be established in Cyprus with a branch in Egypt, and include active participation and engagement of all countries, institutes and/or individuals involved from Greece, Turkey, Egypt, Lebanon and Jordan notably.

Blue Biotech & Aquaculture Postgraduate Course for the Central Mediterranean

Mr Vassilios Roussis (National & Kapodistrian University of Athens, School of Pharmacy) presented the Blue Biotech & Aquaculture Postgraduate Course for the Central-East Mediterranean, which has an aim to contribute to the **creation of an interdisciplinary flexible programme** that will allow graduates to have a very good understanding of the marine biotechnological opportunities, notably in the Central-East Mediterranean. Institutions from Croatia, Cyprus, Egypt, Greece, Italy and Jordan but also from Israel, Slovenia, Turkey and Lebanon are encouraged to join forces and create a joint flexible postgraduate course that will offer educational, training and exchange

possibilities among the participating institutions. The postgraduate courses can be organised into a joint Master of Science programme; summer schools and distance learning opportunities.

Developing E-learning tools

Mr Efstratios Spyrou (University of Piraeus) presented the value added of developing E-learning tools. E-learning can play an important role in extended education as it can **complement formal education while overcoming the limits of time and location**. E-learning courses offer many comparative advantages for students and professionals of the maritime industry, and could virtually address every component of the blue economy. Yet, existing e-learning programmes focusing on maritime activities are still rather few.

The Mediterranean Forum for Maritime Education and Training

Lorenzo Schiano di Pepe (University of Genoa) highlighted the role that a potential Mediterranean Forum for Maritime Education and Training could play. The forum aims at **providing a platform for stakeholders to collectively identify and address shared challenges by encouraging dialogue and exchanges**. Flexible meeting structures could be created on a thematic basis, with industry, education & training institutions as well as policy-makers getting together on a regular basis over, e.g. one year. Most importantly, support and buy-in from both institutional actors as well as stakeholders on the ground is needed, to bring stability whilst ensuring that solutions tackle real maritime education and training needs.

Role and priorities of the Union for the Mediterranean

Ms Emmanuelle Gardan provided an overview of the actions promoted by the Union for the Mediterranean (UfM), an intergovernmental institution bringing together 43 countries to promote dialogue and cooperation in the Euro-Mediterranean region. The UfM is mandated to serve as:

- A platform for regional & policy dialogue, promoting the exchange of views, ideas and best practices on regional challenges between relevant partners and stakeholders;
- A platform for regional dialogue between the stakeholders (not restricted to national authorities but also involving private sector and the civil society in different areas);
- A recognised regional actor labelling concrete projects which have a regional dimension/Mediterranean dimension but also which have impacts on the ground.

Its mandate counts 3 main priorities: youth employability and inclusive growth, women's empowerment, sustainable development and infrastructures. Based on a North/South co-ownership governance principle, priorities are addressed through 6 areas: business development, social and civil affairs, higher education and research, water and environment, transport and human development, energy and climate action. Projects that are presented by the secretariat to the 43 members for the UfM labelling are projects that encompass a real Mediterranean dimension with the aim to promoting to promote regional integration

Ms Gardan reminded participants that one of the main elements of the UfM Declaration is that Ministers recommended to the UfM Secretariat to promote the networking between maritime education and training institutions. As a follow-up – and back-to-back to the European Maritime Days - the UfM secretariat and the European Commission will discuss the mission and structure of the UfM Platform for Dialogue on Blue Economy. **The previously mentioned Mediterranean Forum for Maritime Education and Training could be one of the UfM Blue Economy Platform's components**. The Forum should take into account existing networks and involve them in the Forum's work and activities. The 3rd Arab-Euro Conference on Higher Education which will take place in Barcelona from 25 to 27 May 2016 could be a relevant opportunity to present the Forum's initiative.

Session III: Towards a 'Passage plan' for Maritime Education in the Med

The DG Mare Agenda in the area of maritime education and training

Ms Alessia Clocchiatti indicated that DG MARE would like to further explore and develop the idea of a Forum at Mediterranean level. While confirming support to a flexible structure, it stressed the importance to **recognise existing differences** of the higher education and vocational training offer and governance in the sea-basin. Most importantly, **the Forum should be organised along a horizontal, thematic axis converging with the vertical dimension of a multi-layered governance structure**. If successful, this model could be later replicated in other sea-basins.

Ms Clocchiatti informed the audience of upcoming meetings and present opportunities:

- A call for proposals 'Blue Careers in Europe' has been launched on 3rd March 2016 under the European Maritime and Fisheries Fund. Two other currently open calls for proposals target 'Blue Labs' and 'Blue Technology'.
- On 20th April, DG MARE launched a 'call for applications for the selection of members of the informal expert group on skills and careers development in the blue economy', whose task will be to advice the Commission on matters pertaining to the education, training, skills and career development within the blue economy.
- In the context of the European Maritime Days, Ms Clocchiatti will chair a thematic session on 18th May dedicated to skills.
- Towards the end of May 2016, DG Employment will adopt a New Skills Agenda for Europe. Sectorial cooperation, also in the area of maritime affairs, will be encouraged.
- The European Alliance for Apprenticeships (EAfA) will organise the First European VET Skills Week from 5 to 9 December 2016. It will combine activities in Brussels with events at local, regional and national level. Companies will have the possibility to present what they are doing and how they are training their people. All stakeholders are invited to subscribe and be part of it.
- Drop'pin@eures is a portal created by DG Employment in 2015 to match company offers and young unemployed people. A specific maritime section could be added, which in turn could help raising youth awareness on work possibilities across Europe and allow companies to advertise job offers.

Principles for future action

Build on existing cooperation: the proposed Mediterranean Forum should not add another layer of action. Instead, it should involve existing networks and implement lessons learned from previous experiences;

Create synergies: the Forum initiative can benefit from the concerted effort of all interested European Commission Directorate Generals. On the private sector side, there is an opportunity for considering the setting up of a European Economic Interest Grouping[101] (EEIG) to facilitate the pooling of resources and activities;

Open membership: the Forum is to be considered as an opportunity for actors to meet and exchange. In this context, the Forum should not be a 'closed club', but instead ensure open participation to both institutional actors and stakeholders. By doing so, participation will ensure coverage of all business sectors as well as levels of education and training

Avoid red tape: for an efficient trans-Mediterranean network, there is a need to carefully balance administrative and management requirements, for both organisations and final-users (e.g. students, professors). Administrative burden can influence actual participation to trainings, notably for non-EU individuals.

[101] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=URISERV%3Al26015

Invest in communication: a clear communication and dissemination plan should be developed and implemented, to ensure that all Forum's participants and stakeholders are aware of progress and decisions made at each meeting. The Forum could also serve for disseminating information regarding funding opportunities (e.g. Erasmus+, Horizon 2020), and involve clusters and incubators. To be successful in communicating across the whole Mediterranean region, the Forum would need to rely on national and regional 'multipliers'.

Carefully establish a governance structure: organisational issues need to be cautiously considered, including the role of the European Commission, the responsibilities and composition of committees, as well as working and decision-making methods of working groups. Administrative staff should duly mirror the 'South and North' dimension of the Forum.

Think 'local': engaging with local actors can bring real value to education and training initiatives, while ensuring that objectives are actually met. Moreover, private actors such as Small and Medium Enterprises will more likely engage in initiatives that are closer to their range of activity;

How to best support discussed initiatives?

Political endorsement can be more important than financial support. To exist, the project of a Mediterranean Forum should be backed by political actors throughout the Mediterranean sea basin. For the Forum to be sustainable, it needs to be provided with a strong institutional basis.

Make use of existing EU tools: tools and platforms have already been developed by the European Union to provide concrete support to many sectors. It is time to unlock their potential and actually use them. Their usefulness is not limited to the maritime sector and could hence help bridge the gap between skills development and skills demand, recognising both informal and formal learning and ultimately enhance the free movement of student and professionals.

Tap into the potential of E-learning: maritime education and training could significantly benefit from distance learning. Yet, challenges still exist when it comes to certification and recognition.

Create a Mediterranean area for education & training: ultimately, the main aim for cooperating at the Mediterranean level is to ensure more and better working opportunities to our citizens. With cheap labour coming mainly from South-East Asia, the Mediterranean sea basin should overcome skills mismatches and aim for more openness across countries. This also requires stepping-up efforts for accelerated visa delivery in the context of EU-funded projects, as well as extending the recognition of qualifications to all Mediterranean countries, including non-EU. In the case of sea farers, more efforts should be made to ensure that permissions and certifications to non-EU students are issued by the time they enter the job market.

Key messages on cooperation

Focus on quality: cooperation among stakeholders, and notably work that is collectively carried out across Mediterranean countries should be implemented following the same quality standards. By doing so, a student attending half of its degree in Lebanon and another one in Spain would be assured that the education received in both countries is of the highest standards

Target real needs: regardless of the availability of EU support, cooperation should be promoted and supported in those areas where it can bring real benefit. Only at a later stage, EU (or other international organisations) financial support would ensure that cooperation initiatives can be realistically implemented as solutions to concrete needs.

Pool resources: cooperation in the maritime sector should first of all map available resources and facilitate the shared use of facilities, such as training facilities, training ships, simulators, etc… Priority should be given to facilitating access to resources needed for the development of skills in new technologies.

Engage with the private sector: the maritime industry, including Small and Medium Enterprises, has a key role to play in pushing for increased innovation and modernisation of the education and training offer. Ultimately, the triple helix approach to cooperation (private sector, public authorities and education&training providers) is possible, but requires the definition of common standards and shared goals. Indeed, there is a lot of relevant information on the experience gained in other sectors, notably through Erasmus + and INTERREG projects.

Concluding remarks from the European Commission

The European Commission is keen to achieve concrete results in the area of maritime education and training. Only 6 months have passed between the UfM Declaration in November 2016 and the upcoming Blue Economy Working Group meeting in Turku, where DG MARE will present the outcomes of today's discussion.

The idea of a Mediterranean Forum is pertinent and should be further explored. It is an opportunity to share needs and find common solutions. Undoubtedly, cooperation needs to fully recognise the added value of the maritime industry. Yet, focus should not be predominantly on maritime transport. Instead, a clear definition of what the Blue Economy encompasses should be developed in the pertinent fora. At the same time, the exact meaning of higher education and vocational education and training should also be identified and shared across all decision-making levels as well as stakeholders.

On 17th May in Turku, DG MARE will propose the Mediterranean Forum to be developed under the UfM umbrella and be structured around three main pillars:

- The Blue Economy Working Group, as the main institutional and political driver;
- The Stakeholder Platform, to share needs and solutions across participants;
- The Virtual Knowledge Centre, to consolidate and share general, technical and sectoral information.

Further support to the Forum initiative should be promoted through the IMP-MED facility. The project aims at providing technical assistance to participating countries for improving governance of maritime affairs in the Mediterranean sea-basin. Indeed, the events and workshops organised in several countries are an opportunity to promote exchanges on skills, education and training in the maritime sector. The same skills and maritime education component should also be promoted within the BLUEMED initiative for blue growth and jobs in the Mediterranean, to foster integration of knowledge and promote joint actions of relevant research and innovation priorities.

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