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Maritime Alliance for Fostering the European Blue Economy through a Marine Technology Skilling Strategy

Co-funded by the Erasmus+ Programme of the European Union

Highlights of MATES Pilot Experiences

Ocean ProTec.Lab

Layman Report

March 2022

About this Report

This document was developed through the EC-funded Erasmus+ project **MATES: Maritime Alliance for fostering the European Blue Economy through a Marine Technology Skilling Strategy.**

The objective of the MATES project is to develop a skills strategy that addresses the main drivers of change in the maritime industries, in particular shipbuilding and offshore renewable energy. Both sectors are strongly linked and require new capacities to succeed in an increasingly digital, green and knowledge- driven economy.

Duration: January 2018 – April 2022 (52 months)

More information on the project is available at projectmates.eu.

Document information	
Short description	Summary of the results of the Pilot Experience Ocean ProTec.Lab, including the proposal to extend its impact to other local, national and international interested bodies. The main achievements and European added value are clearly outlined to promote further implementation among interested experts and stakeholders.
Next steps	These results present a solid foundation for the Maritime Technologies Skills Strategy and the Sustainability and Long-term Action Plan.
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Contents

Partners involved

Additional Collaborators:

1. Context

MATES: Maritime Alliance for fostering the European Blue Economy through a Marine Technology Skilling Strategy is an EC-funded, ERASMUS+ project whose objective is to develop a skills strategy that addresses the main drivers of change in the maritime industries, in particular shipbuilding and offshore renewable energy.

MATES project established a prioritisation system for 22 Lines of Actions, within which the most important training needs and skills gaps fit. The Pilot Experiences (PEs) were then designed to be coordinated with these prioritised Lines of Actions, while the subsequent detailed planning of the PEs was carried out to ensure a strong alignment with results on the impact of paradigm shifters on the two industries (shipbuilding and offshore renewable energy) [1].

Target beneficiaries include students, teachers, trainers, skilled workers and those who have recently joined the workforce. The outcomes of the Pilot Experiences provide indispensable knowhow for bridging the maritime skills gap and increasing both sectors' overall competitiveness and attractiveness[2]. The insights gained from these activities feed directly into the MATES Sustainability and Long-term Action Plan, which contains policy recommendations and best practices.

Results from this Pilot Experience are particularly relevant for the following stakeholder groups:

- **Local Government in charge of education and vocational and educational training (VET)**
- **Industry**
- **Research and Development Centres/Universities**
- **VET Centres**
- **Secondary Schools**

This report summarises the outcomes and learning elements from one of these Pilot Experiences: *Ocean ProTec.Lab.* The Ocean ProTec.Lab design is aligned with the promotion of attractiveness of maritime careers for early-career skilled youngsters (including gender balance) and with the increasing relevance of cross-curricular skills within the maritime industry. Moreover, its conceptualisation addressed the opportunities for skills diversification from parallel sectors in an environment that also promoted the contact between education and the maritime industry[3].

Initially, the PE was planned to be an in-presence initiative, following a Summer School format. Experts and entrepreneurs from other island regions were targeted to be engaged in the short course. Unfortunately, due to the pandemic restrictions for travelling, the PE had to be adapted and a more local approach was followed.

[1] MATES project Results – https://www.projectmates.eu/results/
[2] MATES project Pilot Experiences – https://www.projectmates.eu/pilot-experiences/
[3] MATES project Pilot Experience Ocean ProTec.Lab – https://www.projectmates.eu/pilotexperience/ocean-pro-tec-lab/

2. Overview of Ocean ProTec.Lab

The main objective of the Ocean ProTec.Lab Pilot Experience was **to establish a laboratory for professional and technical promotion as an attempt to educate and guide young students on their way to blue careers**. This initiative included educational activities of immersion in maritime professions in the Azores by promoting several theoretical and practical knowledge transfer and anchor concepts of ocean literacy and maritime literacy. It enabled youngsters to have direct contact with the broad experience of workers of the Sea Cluster and business experts.

The Ocean ProTec.Lab was therefore **a short-term course to create an environment for critical sharing and learning between trainers, maritime professionals and young students** (from VET and secondary education), in a methodological concept that brought together the actors from education and companies.

Specific objectives of Ocean ProTec.Lab were to:

- **Educate and guide young students on blue economy careers**
- **Raise awareness about the ocean**
- **Create an environment to bridge the gap between education and local industry**

The MATES Pilot Experience took place in the Azores (Portugal), through a collaboration between FRCT – Regional Fund for Science and Technology (MATES partner) and EMA – Azores Sea School[4], the main local partner (VET centre). It also involved MATES partners (Fórum Oceano and Fundación CETMAR) and several local stakeholders from education, academy and industry.

The Ocean ProTec.Lab ran from mid-April to early June 2021. It was developed to include two main educational interventions for the promotion of ocean literacy and the transversal skills needed to succeed in the maritime sector:

- Online activities through educational platforms designed for the **discovery of local maritime careers**.
- The **Ocean ProTec.Lab Live Experience**, through technical and educational activities in the city of Horta.

This report outlines the approach taken in each intervention and summarises the achieved results and learning outcomes that can be applied to other contexts such as different settings and geographic locations.

2.1. Discovery of Maritime Careers

The first intervention was mainly online and was held through the following activities:

- **Public Launch** in social media to recruit participants from Azorean VET and secondary schools from the whole archipelago (nine islands). Each team included two students and one mentor (trainer or teacher).
- **Activity "Sea Reporters"**, where all registered teams were virtually guided and challenged to discover the maritime professions in their islands, ranging from past to the potential future occupations.
- **Exhibition "Sea Professions"**, hosted by the Azores Regional Assembly (Horta), where one team selected by peers presented the main results of the Activity "Sea Reporters".

[4] https://www.emazores.pt/

These activities aimed to bring young students closer to the Azorean sea cluster through the discovery of maritime professions: the past, the present and those that may emerge in the future. The main highlights are as follows:

- ✓ The pedagogical staff designed the **short course as a team contest during the activity "Sea Reporters"**, in order to select the three best teams for the Ocean ProTec.Lab Live Experience. This contest was framed by a **regulation with guidelines**.
- ✓ Online registration was slightly extended, since the Pilot Experience overlapped with high workload for VET students (e.g. work assignments and tests). **Twenty-one students from six islands registered in the activity**. After registration, participants accessed the contest regulation.
- ✓ During the **"Sea Reporters"**, the **first challenge** was to take an image of the professions, characterizing them through actions, equipment or instruments. The **second challenge** included video or audio interviews to professionals according to a script available in an online platform. By the end of the activity, all teams had participated in an online session for sharing experiences and reflections. They also chose the team to present the sea reports and the conclusions in the Azores Regional Assembly. **Eight students from four islands/teams concluded the activity, developing a sea report in a virtual board/poster (Figure 1)**.
- ✓ The **Exhibition "Sea Professions"** was displayed in the Azores Regional Assembly and was open to the public. **The selected team presented the previous activity and also an Open Letter about challenges for maritime professions**.

Figure 1. *Exhibition "Sea Professions" displaying posters from the activity "Sea Reporters".*

✓ Unfortunately voting on the reports according to criteria mentioned in the challenges' rules was not performed due to the low number of participating teams. Thus, the **four teams were further invited to participate in the final activity Ocean ProTec.Lab Live Experience**.

These discoveries concerning maritime careers enabled **students to develop transversal skills**, including critical thinking/analysis, team work and communication. Moreover, by structuring an interview guide for maritime workers, students also developed investigation skills. During the preparation of the Exhibition "Sea Professions", they produced social media contents and critically organised ideas by structuring communication and argumentation pieces. Finally, close contact with the regional assembly deputies during the Open Letter presentation stimulated the development of citizenship skills.

2.2. Ocean ProTec.Lab Live Experience

The second educational intervention took place in EMA facilities and other locations in Horta.

It provided an immersion in the maritime professions for the student teams and mentors/tutors. Each team represented one Azorean Island/school: Pico (*Escola Profissional do Pico*[5]), Faial (*Escola Secundária Manuel Arriaga*[6]), Terceira (*Escola Secundária Jerónimo Emiliano de Andrade*[7]) and Graciosa (*Escola Básica e Secundária da Graciosa*[8]).

[5] https://www.ep-pico.com/
[6] https://esmarriaga.org/
[7] https://esjea.edu.azores.gov.pt/
[8] https://ebsg.edu.azores.gov.pt/

The educational offer included: i) technical workshops; ii) on-board and pier conversations; and iii) study visits to several areas of maritime operations.

Maritime professionals, entrepreneurs, scientists and technicians presented their professions and the underpinning training pathways. The working areas included MATES sectors (shipbuilding/ship repair, offshore renewable energy) as well as parallel sectors (e.g. maritime tourism, aquaculture, marine sciences). Professionals engaged in these work contexts were enrolled in on-board conversations, whereas invited professionals from the education sector participated in pier conversations.

The Live Experience took place over four consecutive days:

DAY 1

Introduction to EMA facilities, MATES project and the framework behind the organisation of Ocean ProTec.Lab, followed by the **Open Letter presentation by students**.

DAY 2

It was focused on the **contact with several maritime professionals**.

- ✓ The participants were on board with the company Naturalist[9] and **learned about Ocean Literacy principles and the transversal skills** needed for a maritime tourism guide (Figure 2).
- ✓ They **had their first taste of underwater diving**, which was a most enjoyable experience for the students.
- ✓ In OMA – Azores Sea Observatory[10], located in a reconverted whaling station, a **visit took place to the Interpretation Centre**. Students also **participated in the first pier talk**, engaging with a retired maritime professional who presented an overview about the topic **"Whaling Heritage and Legacy in Shipbuilding"**.
- ✓ Finally, the participants contacted four experts in shipbuilding/ship repair during **another pier talk entitled "21st Century Opportunities and Challenges for Shipbuilding/Ship Repair in the Azores"**. These experts had extensive work in several shipbuilding areas, such as mechanics, electronics, rigging and fibre composites.

DAY 3

It was **mostly dedicated to technical workshops** covering topics such as aquaculture, communication simulators, navigation simulators, seamanship and mooring techniques.

- ✓ The workshops addressed **technical skills needed for a wide range of maritime careers**. Attendees experienced, for example: how to make an on-board VHF communication; how to launch rescue equipment; what it is like to be at the helm of a ship in virtual space; and how to work cables and moorings.
- ✓ The day ended with an **online pier talk about blue entrepreneurship**. The students engaged with two experts who presented **reference and innovative projects in shipbuilding and offshore renewable energies**: i) the development, manufacturing

[9] https://www.naturalist.pt/
[10] http://oma.pt/

and trading of electro-solar vessels; ii) a pilot project that developed a wave energy centre in the Azores.

DAY 4

It consisted of multiple **contacts with scientists, technicians, entrepreneurs and other professionals**.

- ✓ Scientists and technicians presented **challenges to technical and professional training and how oceanographic missions work with the new technologies and remote maintenance systems**.
- ✓ Students also **visited the port and logistics operations area**, where seafarers' categories and duties were introduced.
- ✓ The **second and final session about blue entrepreneurship** introduced **two local projects about aquaculture and maritime tourism**. The project from aquaculture is Flying Sharks[11], a company that frequently moves marine animals in large shipping containers by sea, road or air. Naturalist[12] is the maritime tourism project that combines whale watching, science tourism and environmental tourism (see Day 2)

Figure 2. *Ocean ProTec.Lab Live Experience: an on-board talk about maritime tourism operations.*

Altogether, **the immersion experience provided a range of Maritime and Ocean Literacy education and technical skills training to VET and secondary school students**.

The Ocean ProTec.Lab raised awareness about the ocean. It also motivated young students to find out about traditional professions that they had not previously shown interest in and demonstrated a large number of possible blue economy careers unknown to them. **Occupations related to shipbuilding and offshore renewable energies were also addressed**, despite both sectors being under-represented in the local blue economy.

[11] https://flyingsharks.eu/

[12] https://www.naturalist.pt/

Summary of Participants Engaged in Ocean ProTec.Lab

Location	Horta, Azores (Portugal)
Hours of Training	**36**
Participants	**16**, from which: 9 students 1 from EQF Level 5 3 from EQF Level 4 5 from EQF Level 3 (8 female, 1 male) 7 teachers/trainers/tutors (6 female, 1 male)
Schools reached	**4**

Attendees' responses to a survey about their experience of the training were very positive (Figure 3).

From a maximum score of 5 points, the overall feedback from the experience was 4.43. Other scores ranged from 4.43/5 to 4.71/5 and included topics related with organisation, planning and materials.

Attendees' additional comments mentioned Ocean ProTec.Lab as a great experience, an excellent opportunity to try different training activities, an unforgettable journey and a very enriching and interesting activity that provided a better understanding of the ocean.

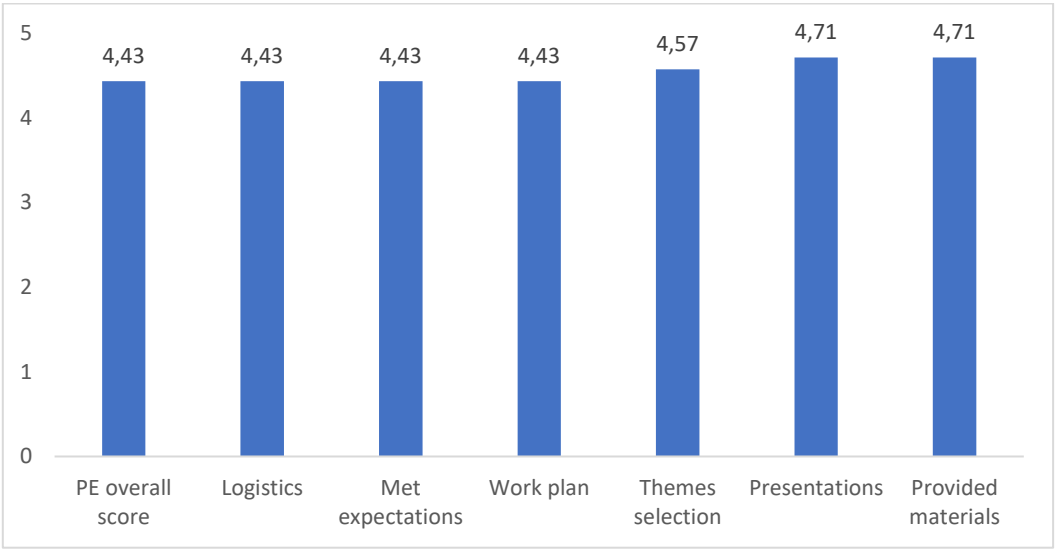


Figure 3. *Summary of survey responses from the Pilot Experience attendees. Response rate: 63.7%.*

3. Achievements

The Ocean ProTec.Lab stated objectives were achieved. This Pilot Experience raised awareness about the ocean and young students were educated and guided with regard to blue economy careers. Additionally, by promoting contact between different actors, the Ocean ProTec.Lab also created an environment to bridge the gap between education and local industry. Here we outline the materials available and their main impact.

3.1. Results: Education and Training Materials

The Ocean ProTec.Lab training materials[13] include:

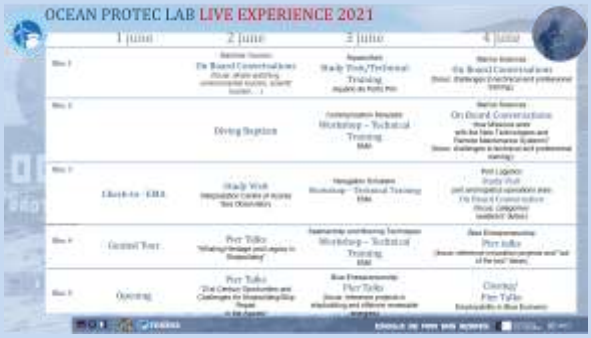
Pilot Experience methodology

Learning outcomes

During the "Sea Reporters" activity, the students **discovered** a broad range of maritime professions, **identified** familiar occupations, **undertook** interviews to some maritime workers and **outlined** posters showing their conclusions.

Students were also stimulated **to interact** and to choose a team to present the "Sea Reporters" results to regional assembly deputies.

Ocean ProTec. Lab Live Experience programme

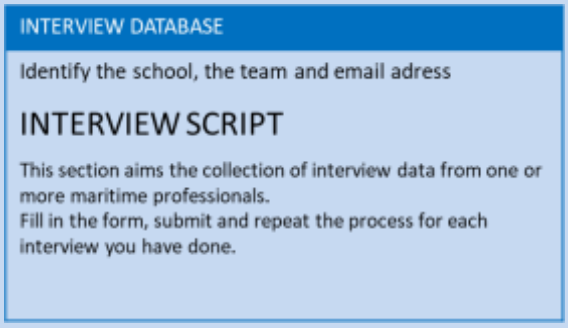


Learning outcomes

Technical and educational activities enabled attendees to make contact with maritime professionals and **learn** what they do, what skills they need to have and how they made their way to a blue career.

They also **reflected** on the employment challenges for the XXI century (including shipbuilding/ship repair) and on the importance of professional training for technical capacity building of local maritime cluster.

Online materials



Learning outcomes

The students **learned** about other maritime activities listed in the survey forms, **approached** the most frequent maritime professions in their islands and **developed** transversal skills such as working in teams, investigation, communication (including digital), critical/thinking/analysis and citizenship.

[13] https://www.projectmates.eu/pilotexperience/ocean-pro-tec-lab/

3.2. Impact

3.2.1. How does Ocean ProTec.Lab benefit the maritime sector?

- A total of **20 maritime professionals were engaged during the live experience** (Figure 4), representing industry entities, social stakeholders and one higher education institution. Those professionals shared **employment challenges in maritime activities, thus enabling young students to be aware about blue careers and the importance of technical training**.

- Although most youngsters wish to pursue careers other than maritime careers, they were nevertheless interested in understanding how to achieve them in the future. In this activity, **two VET students showed interest in EQF level 5 training offer**.

- In addition to attracting youngsters for maritime careers, **similar educational interventions could create stronger linkages between schools, VET centres and industry**.

- Taking into consideration that the main target audience of this Pilot Experience were VET and secondary school students, the Ocean ProTec.Lab initiative attracted interest from **EMA**, which **is very interested in launching further editions/courses**. However, in order to engage more participants, next editions/courses should be planned to be implemented in a period when students have more time to dedicate and to explore other paths to increase the number of teams.

- The **presentation of Ocean ProTec.Lab results and materials should be made locally** to trainers and teachers in order to encourage their students to participate in next editions/courses of this Pilot Experience.

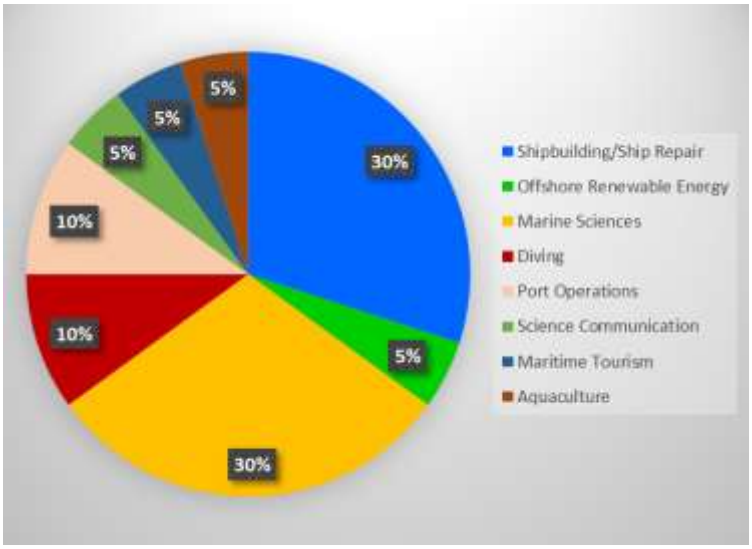


Figure 4. *Distribution of the engaged maritime professionals by local Blue Economy sectors.*

3.2.2. Innovative approaches

This initiative promoted **skills and knowledge transfer to youngsters by blue economy actors from traditional and emerging sectors**, including technology-driven ones. Therefore the innovative approach presented here included the **development of a hybrid experience, combining online and in-presence educational interventions** as follows:

- Different challenges were promoted during the Discovery of Maritime Professions. In order to assess the work of the participant teams, presentations summarizing the achieved learnings and conclusions were undertaken.

- Ocean Literacy principles together with more technical content were introduced during the Ocean ProTec.Lab Live Experience.

OUTCOMES

- **One short-term course useful for professional and technical promotion, which aims to educate and guide young students on their way to blue careers, as well as to bridge the gap between actors from education and companies.**
- **A set of training materials available on the Marine Training platform[14] and expression of interest from EMA in replicating the same pedagogical intervention in further editions, but during a different school period.**
- **Due to COVID-19 restrictions, this Pilot Experience replaced a Summer School designed to achieve a higher impact at local and regional scales. However, participants' feedback was very stimulating and their words highlighted Ocean ProTec.Lab as a very enriching and interesting activity that provided a better understanding of the ocean and as an unforgettable journey. Two VET students showed interest in EQF level 5 training offer related with blue careers.**

[14] https://www.marinetraining.eu/node/3410

4. European Added Value

The Ocean ProTec.Lab Pilot Experience provided informal education focused on Ocean Literacy and skills related to the maritime sector. By launching this laboratory for technical and professional promotion in the Azores – a European outermost region with strong connections to the sea – the Ocean ProTec.Lab has provided us with insights that can be applied to a wide range of stakeholders and settings.

The promotion of Ocean Literacy among young people was undertaken using different innovative approaches. First, by online activities using forms and guided by tutors. Second, in collaboration with several maritime professionals.

Similarly to other MATES Pilot Experiences, the initiative presented here highlights the Europe-wide need to get young people engaged with the maritime industry and the maritime technologies. The results demonstrated the added value of enhancing linkages between industry and education[15].

While the Ocean ProTec.Lab follows the Blue Growth Communication from the Commission[16], particularly in key areas that can deliver sustainable growth and jobs, this kind of learning experience also helps to develop technical and transversal skills[17]. Moreover, it could also establish itself as a **good practice of educational innovation**, considering the international recommendations stated in the Education 2030 Agenda (UNESCO)[18].

The methodology used in this Pilot Experience can be replicated in other European vocational training programmes in the sectors covered by the MATES project as well as in parallel blue economy sectors. In this context, continuous stakeholder engagement at the local, national and international scales may contribute to the implementation of "Laboratories promoting blue professions and technical skills" on other islands and regions, such as Macaronesia and the outermost regions.

Therefore Ocean ProTec.Lab main lessons learnt can be summarised as follows:

Engagement with industry and academy stakeholders: Awareness about blue careers attractiveness can be promoted through VET/education collaboration with maritime workers, entrepreneurs, scientists and technicians.

Flexible approach when planning training actions: Combining online and in-presence interventions clearly shows that similar contents can be presented differently.

Open the activities to teachers and trainers: Like participant students, teachers and trainers can increase awareness about blue careers and benefit from their participation.

[15] https://www.projectmates.eu/pilotexperience/mol2/
[16] COM (2012) 494 final. Blue Growth opportunities for marine and maritime sustainable growth, Policy Document.
[17] New Skills Agenda for Europe - Employment, Social Affairs & Inclusion - European Commission.
[18] Ocean Literacy | IOC UNESCO. Available: https://ioc.unesco.org/index.php/topics/ocean-literacy.

Ocean ProTec.Lab tackled eight out 22 lines of actions identified during the first year of the project. The methodology beyond this Pilot Experience was extremely relevant to the promotion of transversal skills and Ocean Literacy for the maritime sector and aimed at achieving more talented maritime workers and a sustainable maritime industry.

Transversal skills

Online and in-person activities tackled several transversal skills, e.g.: communication (including digital), team work, investigation, critical thinking/analytics and citizenship.

Ocean Literacy

This Pilot Experience enabled young students to have direct contact with the experience of workers from the Sea Cluster, including workers from traditional sectors, entrepreneurs, scientists and technicians.

Gender Balance

Recruitment of young students considered gender balance as a criterion for team building.

Skills ecosystem

The Ocean ProTec.Lab created an environment for critical knowledge exchange between trainers, maritime professionals and young students (VET and secondary education), bringing together actors from education and local industry.

Skills diversification in parallel sectors

The short course engaged several experts and/or entrepreneurs from parallel sectors (e.g. aquaculture, marine sciences, marine operations, port logistics, maritime tourism, professional diving) whose career pathways showed the technical and transversal skills needed for blue professions.

All Layman Reports and education and training materials from all the MATES Pilot Experiences are available on the MATES website and include:

ED2MIT: Education and Training for Data Driven Maritime Industry projectmates.eu/pilotexperience/ed2mit
MOOCs on Industry 4.0 and the naval sector projectmates.eu/pilotexperience/mooc-training-course
Freeboard projectmates.eu/pilotexperience/freeboard
The Magnus Effect projectmates.eu/pilotexperience/the-magnus-effect
Innovation Manager in Shipbuilding Course projectmates.eu/pilotexperience/innovation-manager-course
Additive Manufacturing and Risk Management in the Shipbuilding and Ship Repairs Sectors projectmates.eu/pilotexperience/training-seminar
MOL^2 Maritime on the Loop of Ocean Literacy projectmates.eu/pilotexperience/mol2
Offshore Renewable Energy Courses projectmates.eu/pilotexperience/renewable-energies-crash-courses
Ocean Pro.Tec Lab projectmates.eu/pilotexperience/ocean-pro-tec-lab
Green Move projectmates.eu/pilotexperience/green-move
Definition of New Occupational Profiles projectmates.eu/pilotexperience/dop-definition-of-new-occupational-profiles

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