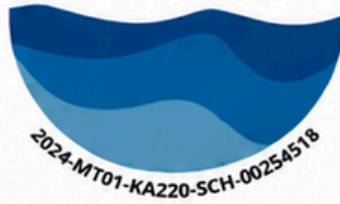


BLUE OCEAN

ERASMUS+ PROJECT



Impact Measurement Methodology for a Blue Education Area between Europe and the Pacific Ocean



Lycée Diadème
Te Tara o Mai'ao
French Polynesia

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General High
School of Sitia
Greece

Gozo College
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BLUE OCEAN

STATISTICAL REPORT

RESULTS OF THE IMPACT MEASUREMENT TOOL FOR THE PROMOTION OF BLUE CAREERS AND OCEAN PRESERVATION

Evidence and implications for school directors and school policy makers

Experimentation of the School Guidelines for the institution of an EU-Pacific Blue Education Area
Tahiti (French Polynesia), Lipari (Italy), Sitia (Greece) and Gozo (Malta)

Data analysis: Igor Vitale International - Italy

Data collection:

Lycée Diadème Te Tara o Mai'ao - French Polynesia

IS Isa Conti Eller Vainicher - Italy

General High School of Sitia - Greece

Gozo College - Malta

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A word from the author



Igor Vitale

Founder and Director, Igor Vitale International srl – Foggia, Italy

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In BlueOcean, Igor Vitale International wrote the chapter on systemic school strategies and career guidance, developed the scale on students' interest towards blue careers, coordinated quality assurance and carried out the analysis presented in this report.

Dear school directors,

for most of my professional life I have worked where psychology, education and work meet: helping young people to understand what they want to become, and helping schools and organisations to support them. When the BlueOcean partners asked me to analyse what their students think about the ocean and about their future, I expected to find young islanders who did not care much about the sea. I found the opposite.

The students of Tahiti, Lipari, Sitia and Gozo love their sea, understand its importance and want to protect it. What they lack is not motivation, but a **bridge**: someone who shows them that the ocean can also be their job, their university course, their future at home or abroad. Building that bridge is not a task for a single enthusiastic teacher. It is a choice of school leadership.

This is why I wrote this report for you. You will find numbers, but above all you will find what these numbers mean for your school and, for every result, concrete actions taken from the EU-Pacific Operational Guidelines that our partners have written together. I hope it will help you to turn the love of your students for the sea into a real opportunity for their lives and for your communities.

Igor Vitale

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Key messages for school directors

Why this report is worth fifteen minutes of your time

If you lead a school on an island or along a coast, the sea is your students' daily landscape and, for many of them, their most likely future workplace. This report answers three questions that every school director in this situation should be able to answer:

- **What do my students really think** about the ocean, about protecting it and about working with it?
- **Where exactly is the gap** between what they value and what they plan for their future?
- **What can my school do** – from next school year, with the resources it already has – to close that gap?

The answers come from 209 students of four island schools in Tahiti, Lipari, Sitia and Gozo, and they are linked, page by page, to the practical guidance of the EU-Pacific Operational Guidelines written by the BlueOcean partners. **If you have five minutes**, read these key messages. **If you have fifteen**, add the action plan in Section 13. The rest of the report is there for your staff, your guidance team and anyone who wants to check the evidence.

What we found, in short:

- **Your students care about the ocean and know its importance.** In all four schools, students strongly value the ocean and understand its role for the planet (average scores of 4.15 and 4.13 on a scale from 1 to 5). The foundations of a Blue Education Area are already there.
- **The weak link is the step from valuing the ocean to choosing it as a future.** Interest in blue careers (3.63) and, above all, interest in scientific university studies linked to the sea (3.44) are clearly lower. Only 40% of students see blue economy professions as relevant to their own future, and only 44% intend to enrol in a scientific or technical degree.
- **Students are willing to act, but schools offer few organised opportunities.** Most students avoid harmful behaviours and are ready to change their habits; far fewer take part in clean-ups, ocean projects or activities that explore blue careers.
- **Doing leads to choosing.** Students who act for the ocean are the same students who are interested in blue careers and scientific studies, while knowledge alone is only moderately linked to career choices. Lessons need to be translated into people, roles and pathways.
- **Schools can learn from each other.** The students of Tahiti have the strongest results on every dimension; Gozo is relatively stronger on interest in scientific studies and Sitia on ocean literacy; Lipari and Sitia need the most support to open scientific pathways.
- **National policies leave the blue dimension to schools.** In all four countries sustainability is part of the curriculum, but the ocean is almost never named explicitly, and support to teachers and schools is uneven (Section 4). The blue dimension will exist only if school leaders decide to build it.
- **You now have a reliable tool.** The questionnaire used in this study proved to be reliable and can be used by every school, every year, to see whether its actions are making a difference.

Introduction

The Erasmus+ project **BlueOcean: mainstreaming a Blue Education Area in Europe and the Pacific Ocean School** (project reference 2024-1-MT01-KA220-SCH-000254518) aims to reduce the gap between school and work and to empower coastal, marine and remote schools in the promotion of Blue Careers. Its partners have written the **EU-Pacific Operational Guidelines for Mainstreaming the Blue Education Area in Europe and the Pacific** (in this report, the *EU-Pacific Operational Guidelines*), whose previous chapters defined the strengths and weaknesses of the national education systems (Chapter 1), the EU-Pacific alliance for a Blue Education Area in remote schools (Chapter 2), systemic school strategies and career guidance (Chapter 3), leadership strategies for school directors (Chapter 4), the implementation of school events (Chapter 5) and an indicator checklist of school pre-requirements (Chapter 6). This report closes the cycle by presenting the evidence collected with the **BlueOcean Impact Measurement Tool**, the 50-question instrument jointly developed by the five partners and given to students during the experimentation of the School Guidelines in the partner schools.

The report is written first of all for **school directors, school leadership teams and school policy makers**, and for the teachers and guidance staff who work with them. For this reason, every statistical indicator is explained in plain terms (Section 6.3), every result is followed by its meaning for the school, and every dimension ends with a box indicating which parts of the EU-Pacific Operational Guidelines can help a school to improve that result. Page numbers in these boxes refer to the compiled manual of the Guidelines.

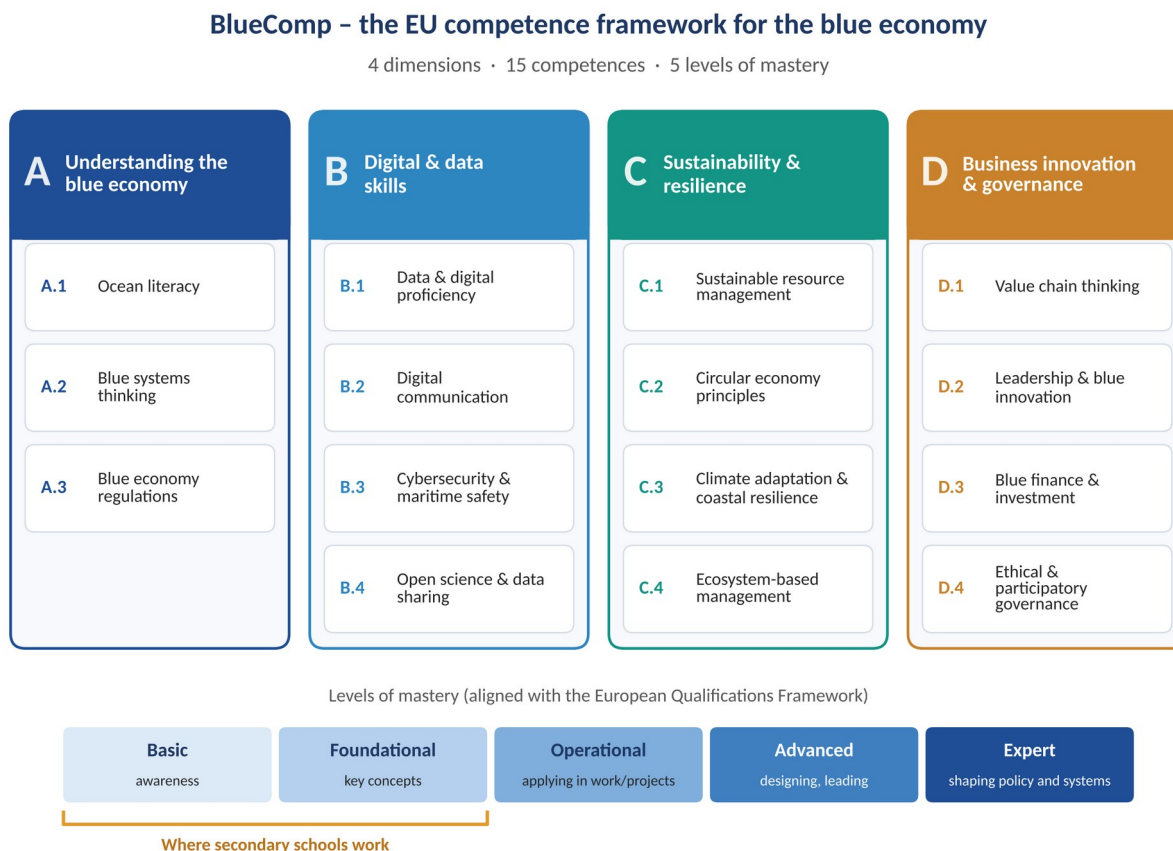
The questionnaires were administered by the partner schools, while Igor Vitale International was responsible for the analysis of the data. The report covers **209 student questionnaires** collected in French Polynesia (53), Italy (50), Greece (50) and Malta (56).

1. The European reference framework: BlueComp

BlueComp - the competence framework to navigate the blue economy is the European Union's reference framework for the competences needed in the blue economy. It was developed for the European Commission (Directorate-General for Maritime Affairs and Fisheries, with the European Climate, Infrastructure and Environment Executive Agency) within the *Study to support and design skills development in the blue economy* and was presented in September 2025 (Abbagnano Trione et al., 2025). Like GreenComp for sustainability or DigComp for digital skills, it offers a common language to describe what people need to know and be able to do, so that schools, training providers, employers and public authorities can align their actions.

BlueComp is organised in **four dimensions and fifteen competences**. Each competence is described across **five levels of mastery - Basic, Foundational, Operational, Advanced and Expert** - which are conceptually aligned with the European Qualifications Framework (EQF) and with the ESCO classification of skills and occupations. The framework is described as a “living” tool that complements, rather than replaces, national and sectoral training systems; competences from different dimensions can be combined, like pieces of a puzzle, to describe a specific blue job.

Table 1. The structure of BlueComp: dimensions and competences



Source: Abbagnano Trione et al. (2025), BlueComp: The competence framework to navigate the blue economy. Publications Office of the European Union.

Why BlueComp is important for insular schools . BlueComp is mainly addressed to education and training providers, policy makers and employers, and its upper levels describe professional competences. Secondary schools work at its foundations: they build the **Basic and Foundational levels** – awareness, understanding of key concepts, motivation – on which later vocational, university and professional training will build. The five scales of the BlueOcean Impact Measurement Tool can be read as indicators of these foundations. Table 2 shows the correspondence proposed in this report (it is an interpretation by the authors, not part of BlueComp).

Table 2. Correspondence between the BlueOcean scales and BlueComp

How the BlueOcean dimensions connect to BlueComp

BlueOcean dimension (what it captures at school)	A Understanding the blue economy	B Digital & data skills	C Sustainability & resilience	D Business innovation & governance
Interest towards blue careers Motivation to know and choose blue economy jobs	A.2 Blue systems thinking	career horizon	career horizon	D.2 Leadership & blue innovation
Pro-environmental attitudes Value given to the ocean; balance between protection and economy			C.1 Resource mgmt C.4 Ecosystem mgmt	D.4 Participatory governance
Pro-environmental behaviours Everyday and collective actions for the ocean			C.1 Resource mgmt C.2 Circular economy C.3 Climate adaptation	
Interest towards STEM university studies Intention to follow scientific and technical studies leading to blue jobs	A.2 Blue systems thinking	B.1 Data & digital B.4 Open science	scientific basis of C.3 and C.4	
Ocean literacy Understanding of the ocean's role for the planet and for people	A.1 Ocean literacy (direct match)			

Interpretation proposed in this report
 main correspondence
 related or contributing

Read in this way, the results of this report show where the foundations of BlueComp are already solid in our schools (ocean literacy and the values of sustainability) and where they are still fragile (the motivation to enter blue occupations and the scientific and digital pathways that lead to them).

2. Purpose of the report and criteria used

The report responds to the project objective **to measure the impact of the School Guidelines in promoting students' interest towards blue careers**. Five variables are measured on a minimum of 200 students: interest towards blue careers; pro-environmental attitudes for ocean preservation; pro-environmental behaviours for ocean preservation; interest towards STEM university curricula related to blue careers; and ocean literacy. Table 3 summarises the criteria used to judge the quality of the data and to interpret the results.

Table 3. Criteria applied in this report and their source

Criterion	Threshold	Source
Number of students who completed the Impact Measurement Tool	≥ 200 students in total; ≥ 50 students per country	Project indicators for the experimentation of the School Guidelines
Reliability of each scale	Cronbach's alpha ≥ .70	Psychometric standard adopted in the BlueOcean project

Criterion	Threshold	Source
Level of each student on each 10-item scale (score 10–50)	10–19 low; 20–35 moderate; 36–50 high	Scoring and interpretation guidance, Chapter 3 of the EU-Pacific Operational Guidelines

3. The participating schools and their territories

The four schools that took part in the experimentation share a condition that is central to the BlueOcean project: they are located on islands, and in two cases on islands of other island states or regions (“double insularity”), where the sea is at the same time the main resource, the main border and the main horizon of young people. The results must be read against these contexts, which are summarised below from the partners’ profiles and from the SWOT analyses of Chapter 1.

3.1 Tahiti, French Polynesia – Lycée Diadème Te Tara o Mai’ao

Photo 1. The BlueOcean Partnership at Lycée Diadème Te Tara o Mai’ao / Tahiti during the Train the Trainers activity



French Polynesia is formed by 118 islands in five archipelagos, spread over such a vast ocean area that 6,000 km separate the two most distant islands; fishing, tourism and shipping are the pillars of the economy, while lagoons and coral reefs face coastal erosion, cyclones and climate change. The Lycée Diadème, in Pirae (Tahiti), is the largest high school of the territory: about 2,300 students aged 15 to 22 and 255 teachers, with general, technological and vocational courses and post-secondary technician sections. Students come from many islands, and about 400 live at school all year round, returning home once a year. Youth unemployment is very high: almost half of young adults are without a job.

The territory has some of the most developed ocean education practices of the partnership: the **Educational Marine Areas** (Aires Marines Éducatives), officially managed by the Directorate General for Education, the **Moana Ambassadors** youth programme, a dense network of NGOs (e.g., Te Mana o te Moana, Coral Gardeners, Science 4 Reef) and research centres (Ifremer, Institut Louis Malardé, CRIOBE), and university degrees on the sustainable ocean. The SWOT also highlights geographic fragmentation, unequal access to resources across islands, the risk of brain drain towards mainland France and the lower prestige of vocational maritime training (Chapter 1, pp. 5–21).

3.2 Lipari, Aeolian Islands (Italy) – IIS Isa Conti Eller Vainicher

Photo 2. IIS Isa Conti Eller Vainicher, Lipari, Aeolian Islands (Italy) at the Lycee Diademe in Tahiti.



Lipari is the main island of the Aeolian archipelago, off the north coast of Sicily: a UNESCO-listed volcanic landscape with rich marine biodiversity and fishing and navigation traditions, whose labour market is dominated by tourism. The IIS Isa Conti Eller Vainicher is the main vocational and technical school of the island, with 28 classes, technical and vocational courses directly connected to the sea (Transport and logistics – boat masters, Tourism, Hotel hospitality, Agri-food) as well as scientific and linguistic programmes. Lipari lives a condition of double insularity: it is an island of an island region, with limited access to universities, research centres and large employers.

The Italian SWOT (Chapter 1, pp. 22–33) describes a rich offer of national ocean literacy projects and marine higher education, but also the absence of a systemic integration of the ocean in school curricula, the gap between northern regions and southern regions and islands, a weak link between school education and local career opportunities, and teacher training on these themes that is not mandatory.

3.3 Sitia, Eastern Crete (Greece) – General High School of Sitia

Photo 3. General High School of Sitia, Eastern Crete (Greece). The team of BlueOcean at the Transnational Meeting in Sitia.



Sitia is a small town on the eastern tip of Crete, in an area whose economy is based on agriculture and tourism and which is part of the Natura 2000 network. The General High School of Sitia is a rural general upper secondary school with about 350 students and 45 teachers. Many students come from economically disadvantaged families, some live in foster families or work to help their parents, and the school includes refugee and migrant students through dedicated inclusion processes. The school is one of the most experienced in Eastern Crete in European projects and has a strong tradition of outdoor and environmental learning.

At national level, the Greek SWOT (Chapter 1, pp. 39–41) points to valuable but not institutionalised ocean programmes (e.g., Sea Change), a network of Environmental Education Centres that could become “Ocean Literacy Hubs”, maritime academies with high employability but narrow sectors, and weak coordination between ministries.

3.4 Gozo (Malta) – Gozo College

Photo 4. Gozo College experts with the BlueOcean Partnership in Gozo.



Gozo is the second island of the Maltese archipelago, a further condition of double insularity within an island state. Malta's economy is strongly linked to the sea (one of the largest ship registries in the world, ports, cruise and coastal tourism, fishing and aquaculture), while its 196 km of indented coastline is under pressure from tourism, marine litter and warming seas. Gozo College is the largest education provider on the island: 13 state schools (primary, middle and secondary, the latter for students aged 13 to 16) with about 2,700 students and a heterogeneous population that includes many foreign students and students with special educational needs.

The Maltese SWOT (Chapter 1, pp. 42–47) shows a strong participation in Eco-Schools and active NGOs (Nature Trust – FEE Malta), but ocean literacy is only partially integrated into the curriculum, maritime training is concentrated on shipping, and the small size of the country exposes it to brain drain.

Table 4. The four schools in brief

	Lycée Diadème (Tahiti)	Isa Conti Eller Vainicher (Lipari)	General High School of Sitia (Crete)	Gozo College (Gozo)
Type of school	General, technological and vocational high school	Technical, vocational and lyceum programmes	General upper secondary (rural)	College of 13 state schools
Size	≈ 2,300 students	28 classes	≈ 350 students	≈ 2,700 students
Territorial condition	118 islands, 5 archipelagos; boarding students	Double insularity (Aeolian Islands, Sicily)	Rural Natura 2000 area, Eastern Crete	Double insularity (Gozo, Malta)
Main local blue sectors	Fisheries, pearl farming, tourism, research	Tourism, navigation, fishing	Tourism, fishing, agriculture	Shipping, ports, tourism, aquaculture
Questionnaires analysed	53	50	50	56

3.5 Island schools and the Italian “Piccole Scuole” movement

The BlueOcean project was designed with explicit reference to **Piccole Scuole** (Small Schools), the national movement promoted by INDIRE, the Italian National Institute for Documentation, Innovation

and Educational Research: the Blue Education Area was conceived “with special attention to little and remote schools”, and the needs analysis of remote coastal schools drew on the data of this programme. It is therefore useful to read the four BlueOcean schools through the lens of the movement.

INDIRE identifies as small schools the primary schools with no more than 125 pupils and the lower secondary schools with no more than 75 pupils. According to the *Atlas of Small Schools* (school year 2020/21), they are 7,435 primary schools (50.6% of all Italian primary schools) and 1,688 lower secondary schools (23.3%), attended by more than 600,000 pupils; 1,325 of them organise multigrade classes (*pluriclassi*), two thirds of which are located in inner areas (INDIRE, 2023). The movement, however, insists that size is not the only criterion: small schools are those of territories marked by **geographical isolation, difficult access to essential services and depopulation** – mountain areas, inner areas and small islands. Its *Manifesto* (INDIRE, 2020) is built on three principles: “**community of memory and quality of learning**”, the school as the cultural reference point of its community; “**the experience of multigrade classes, a resource and not a limit**”; and “**technologies and social inclusion**”, using digital networks and shared classes to overcome isolation. Around these principles INDIRE runs national research and networks on multigrade teaching, networked classes, socio-emotional learning, the “scuola diffusa” and the territorial educational pacts (Patti educativi territoriali) that link schools with their communities.

How the BlueOcean schools relate to this model. By the numerical criteria, none of the four partner schools is a “small school”: the INDIRE thresholds concern primary and lower secondary education, while the respondents of this study attend mainly upper secondary schools, and two of the partners are among the largest institutions of their territory (Lycée Diadème with about 2,300 students, Gozo College with about 2,700). Yet all four share the **condition** that defines small schools: they serve island communities at the margins of their national systems, far from universities, research centres and large employers, with high teacher turnover and a strong pressure on young people to leave. Lipari and Gozo live a double insularity; Sitia is a rural school at the eastern end of Crete; the Lycée Diadème gathers students from many islands of five archipelagos, about 400 of whom live at school all year round because their families live far from Tahiti. In other words, the BlueOcean schools are the **upper secondary end of a pathway that often begins in small schools** – the primary schools of Gozo’s villages, of the minor Aeolian islands or of the Polynesian atolls – and they receive the students whose aspirations those small schools have shaped.

What BlueOcean can take from Piccole Scuole – and what it can add

Lessons from Piccole Scuole for the Blue Education Area

- **The school as a community of memory.** Island schools are often the main cultural institution of their community. This supports the parts of the EU-Pacific Operational Guidelines that root blue education in local heritage and people: storytelling and local legends (Chapter 1, Lipari, pp. 24–26), community events with fishers and elders (Chapter 4, pp. 98–100) and a register of local blue partners (Chapter 4, p. 110).
- **Small numbers as a resource.** The Piccole Scuole approach to multigrade classes corresponds to the advice of the Guidelines to merge age groups and use mixed-age station rotations in small island schools (Chapter 4, “Event Design in Small School Contexts”, p. 98) and to give older students the role of ambassadors and mentors (Chapter 5, p. 120).
- **Technology against isolation.** Networked classes and shared lessons are the Piccole Scuole answer to isolation; in BlueOcean they correspond to virtual exchanges with scientists and partner schools, the digital Blue Careers Hub and the MOOC (Chapter 2, pp. 58–59; Chapter 3, Guideline 4, pp. 85–86).
- **Territorial pacts.** The Patti educativi territoriali offer a ready-made legal and organisational form for the local partnerships with fisheries, ports, tourism operators and marine protected areas recommended in Chapter 4 (pp. 109–110).

What BlueOcean adds

Piccole Scuole focuses on the quality of learning and on keeping schools alive in marginal territories; it does not address specific sectors or career pathways. BlueOcean brings a **sector-specific orientation** – the blue economy as the main source of local employment – and a **common measurement tool**. The partners could propose the Impact Measurement Tool and the EU-Pacific Operational Guidelines to the small island schools of the Piccole Scuole network (e.g., through INDIRE’s events and the movement’s membership procedure), extending the project’s impact to the primary and lower secondary schools from which island students come.

4. Learning for sustainability in the four education systems

To interpret the students’ results it is useful to know how each education system supports learning for sustainability. The most complete and recent comparative source is the Eurydice report **Learning for sustainability in Europe: Building competences and supporting teachers and schools** (European Commission/EACEA/Eurydice, 2024), which examines top-level policies in 39 European education systems in the school year 2022/2023, following the Council Recommendation of 16 June 2022 on learning for the green transition and sustainable development. The report analyses three building blocks – curricula and competences, teachers and school leaders, and support to schools – and measures the presence in curricula of seven sustainability competences derived from the European framework GreenComp: valuing sustainability, promoting nature, systems thinking, futures literacy, adaptability, political agency, and individual and collective action.

Figure 1 summarises the profile of France, Italy, Greece and Malta on the main indicators of the report. One caveat concerns French Polynesia: the Eurydice data describe the national French system, while in French Polynesia education is a competence of the territorial government, which adapts national

programmes (Chapter 1, p. 5); the French data therefore describe the general framework within which the Lycée Diadème operates, not territorial policies such as the Educational Marine Areas.

	France	Italy	Greece	Malta
CURRICULUM				
Sustainability competences covered – primary school	7/7	5/7	7/7	7/7
Sustainability competences covered – lower secondary school	7/7	5/7	7/7	7/7
Sustainability competences covered – upper secondary school	7/7	6/7	7/7	7/7
Competences taught as a cross-curricular theme – upper secondary	7/7	1/7	0/7	7/7
Project-based integration of sustainability in the curriculum	yes	no	yes	no
TEACHERS AND SCHOOL LEADERS				
Sustainability in teacher competence frameworks	yes	no	no	no
Sustainability learning objectives for initial teacher education	1/5	1/5	0/5	0/5
Sustainability areas covered by in-service teacher training	4/4	2/4	4/4	4/4
Specific CPD on sustainability leadership	yes	no	no	yes
Support measures for teachers (materials, networks, centres...)	6/6	3/6	4/6	5/6
SCHOOLS				
Areas of top-level guidance for whole-school approaches	4/4	1/4	0/4	4/4
Types of top-level financial support for school projects/infrastructure	local/school autonomy	3/8	0/8	6/8
Non-school actors that supported school projects engage	3/5	1/5	0/5	4/5
Sustainability criteria in school evaluations (external, internal)	2/2	0/2	0/2	2/2

Figure 1. Learning for sustainability in France, Italy, Greece and Malta: summary of top-level policies, 2022/2023. Darker cells indicate a more complete provision. Data elaborated from European Commission/EACEA/Eurydice (2024), Figures 1.2, 2.1–2.5, 3.2, 3.4, 3.5, 3.7 and A1–A3.

4.1 Curricula and competences

All four systems include sustainability in their curricula, and none teaches it as a separate subject (in Europe this happens in only nine systems, and it is compulsory only in Cyprus). **France** and **Malta** have the most complete curricular coverage: all seven competences are present at every level and are taught as a cross-curricular theme, so that every subject is expected to contribute. **Greece** also covers all seven competences and defines sustainability as a cross-curricular theme with detailed instructions in primary and lower secondary education; in upper secondary education the competences are found mainly in science and citizenship subjects. France and Greece also integrate sustainability through project-based learning. **Italy** has the least complete coverage of the four: futures literacy is absent at all levels and political agency is absent in primary and lower secondary education, while in upper secondary education only “valuing sustainability” is a cross-curricular theme; the other competences are mainly entrusted to civic education and science.

This pattern is consistent with the European picture: across Europe, the competences linked to *embodying sustainability values* and *embracing complexity* are more frequent in curricula than those linked to *envisioning sustainable futures* and *acting for sustainability*, and futures literacy is the least present competence (23 of 39 systems). It is also consistent with the results of this report, where students’ values and knowledge are much stronger than their projection into the future (career and scientific study interest).

4.2 Teachers and school leaders

The report shows a general gap between what curricula ask and how teachers are prepared, and the four countries are no exception. Only **France** includes sustainability in its general teacher competence framework. Initial teacher education contains at most one of the five sustainability learning objectives examined (France: the interdisciplinary integration of sustainability; Italy: key concepts of ecosystems and biodiversity, for primary teachers only) and none in Greece and Malta. Continuing professional development is stronger: France, Greece and Malta cover all four areas examined (knowledge, innovative methods including outdoor learning, cross-curricular teaching, partnerships with the natural world and the community), Italy two. Only France and Malta provide specific activities on **sustainability leadership** for teachers and school heads. France offers all six types of support to teachers, Malta five (including steering committees, school coordinators and mentoring), Greece four (including sustainability education centres) and Italy three (materials, networks and units of expertise).

4.3 Support to schools

The greatest differences concern the support given to schools as institutions. **Malta** and **France** provide top-level guidance on all four areas of whole-school approaches (school strategies, school development plans, leadership and other areas), include specific sustainability criteria in both external and internal school evaluations and support school projects that involve parents, NGOs and public authorities. Malta also offers the widest range of financial support (six of the eight types examined, including automatic funding for educational tools and promotion campaigns) and national awards such as Eco-Schools and the One Earth programme run by BirdLife Malta. In France financial support is mostly left to local authorities and schools, while the national label “École/Établissement en Démarche globale de Développement Durable” (E3D) rewards schools with a whole-school approach. **Italy** provides general guidance and support to whole-school approaches, three types of financial support (on application) and support for projects co-designed with NGOs (e.g., the 2021 call of EUR 5 million), but no sustainability criteria in school evaluation. **Greece** reports no top-level guidance for whole-school approaches, no financial support for sustainability infrastructure or projects and no evaluation criteria; its main measure is non-financial (e.g., the yearly audiovisual contests of the Ministry’s Educational Radio-Television).

Table 5. Learning for sustainability in the four education systems: strengths and gaps relevant to the Blue Education Area

Education system	Main strengths	Main gaps	Implication for the BlueOcean school
France (framework for Lycée Diadème, French Polynesia)	All seven competences, cross-curricular at all levels; project-based learning; sustainability in teacher competence framework; full set of teacher support measures; E3D label; evaluation criteria	Financial support left to local level; initial teacher education covers only one objective; no ocean-specific measure at national level	Use the strong national framework and the territorial Educational Marine Areas to add the career and STEM dimension that the curriculum does not specify
Italy (IIS Isa Conti Eller Vainicher, Lipari)	Whole-school guidance; NGO co-design funding; labels and other non-financial measures	Futures literacy absent; political agency absent before upper secondary; few cross-curricular competences; no teacher framework; no training on sustainability leadership; no evaluation criteria	Futures-oriented guidance (careers, STEM pathways) must be built by the school itself; school leadership and civic education are key levers

Education system	Main strengths	Main gaps	Implication for the BlueOcean school
Greece (General High School of Sitia)	All seven competences; cross-curricular theme with detailed instructions (primary, lower secondary); project-based learning; complete in-service training content; education centres	No whole-school guidance, no financial support, no evaluation criteria, no involvement of external actors, no training on sustainability leadership	The Blue Education Area depends on the school's own policy: the Integrated School Policy Model and local partnerships of Chapter 4 are essential
Malta (Gozo College)	All seven competences, cross-curricular at all levels; whole-school guidance; widest financial support; evaluation criteria; in-service training on sustainability leadership; Eco-Schools and One Earth	No sustainability content in teacher competence framework or initial teacher education; no project-based integration	A favourable policy environment that can be used to give the ocean and blue careers a stronger place in existing programmes

Source: elaboration from European Commission/EACEA/Eurydice (2024). Data refer to top-level policies in 2022/2023.

4.4 How blue is learning for sustainability?

The Eurydice report also offers an indirect but telling measure of how little the ocean is present in Europe's approach to learning for sustainability. In its 106 pages the words *climate* (56 times), *nature* (69), *recycling* (22), *waste* (20), *energy* (18) and *biodiversity* (15) recur constantly, while *ocean*, *sea*, *marine*, *maritime* and *coast* appear only **7 times in total**, and *marine* and *coast* never (Figure 2). The seven GreenComp competences used to analyse curricula are generic ("promoting nature", "systems thinking") and do not distinguish marine from terrestrial ecosystems; the categories of small-scale infrastructure supported by public funds are bicycles, recycling, school gardens and similar; field trips are described as visits to environmental centres, science museums and nature resorts.

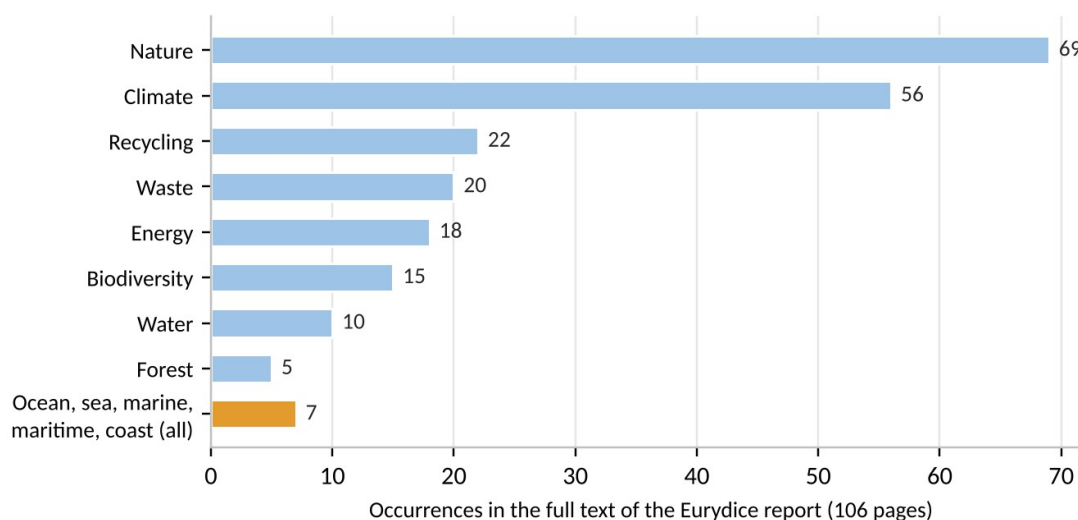


Figure 2. How often selected sustainability themes are mentioned in the Eurydice report Learning for sustainability in Europe (2024). Elaboration on the full text of the report.

The only ocean-specific policies mentioned in the whole report come from **Portugal**: the "Blue School" (Escola Azul) programme, which guides schools working on sea-related issues and builds a community of schools, maritime sector, industry, municipalities, NGOs and universities, and a citizenship education award with a focus on the oceans. Significantly, the Escola Azul is run not by the Ministry of Education but by the Ministry of the Economy and Maritime Affairs. None of the four BlueOcean countries reports an ocean-specific measure at top level, even though all four are island or maritime states with economies strongly dependent on the sea.

This does not mean that ocean education is absent in these countries. Chapter 1 of the EU-Pacific Operational Guidelines documents many valuable initiatives – the Educational Marine Areas and the Moana Ambassadors in French Polynesia, “Il Mare a Scuola” and Ocean Literacy Italia, Sea Change and the Environmental Education Centres in Greece, Eco-Schools and Nature Trust programmes in Malta – as well as European initiatives such as the EU4Ocean coalition and its network of European Blue Schools. But these initiatives are mostly promoted by NGOs, research bodies or maritime authorities, depend on project funding and on motivated teachers, and remain **outside the core of curricula, teacher education and school evaluation**. In the language of the Eurydice report, the ocean is not yet a building block of learning for sustainability; at most, it is one of many possible contexts in which generic sustainability competences can be taught.

What this means for BlueOcean and for school directors

The gap measured in this report has a policy origin. Curricula in all four countries teach students to value nature and understand environmental systems, and our students do (strong attitudes and ocean literacy). Curricula are weaker on futures literacy and action, and teacher education rarely prepares teachers to link sustainability with careers and partnerships – exactly the dimensions where our students are weaker (career interest, organised action and interest in scientific studies). Italy, the system with the least complete curricular coverage (no futures literacy), is also the country with the lowest career and STEM interest; the comparison involves only four systems and cannot prove a causal link, but it is consistent with it.

The ocean must be made explicit. Because European and national frameworks treat sustainability generically, the ocean and the blue economy will enter school life only if schools decide to make them explicit: in the school's mission and annual plan, in cross-curricular projects and in guidance. BlueComp (Section 1) and the EU-Pacific Operational Guidelines give schools the vocabulary and the tools to do it.

Where national support is weak, school leadership must compensate. In Greece and, in part, in Italy, schools receive little top-level guidance for whole-school approaches. There, the Integrated School Policy Model, the local partnership mechanisms and the three-layer funding model of Chapter 4 (pp. 109–114) are not optional extras but the main way to build a Blue Education Area. In Malta and France, directors can build on existing frameworks (Eco-Schools, One Earth, E3D, Educational Marine Areas) and add the blue career and STEM dimension.

A policy message for the consortium. The BlueOcean results and the Escola Azul example support a recommendation to national authorities: to recognise ocean literacy and blue career orientation explicitly within learning for sustainability – in curricula, in teacher education and in school evaluation – as already happens for climate, waste and energy.

5. The BlueOcean Impact Measurement Tool

The tool is composed of five 10-item scales. Each partner developed the scale corresponding to its area of expertise, and the five scales were merged into one online questionnaire translated into the languages of the participating schools. All items are positively worded and rated on the same 5-point scale (1 = I strongly disagree; 2 = I disagree; 3 = I neither agree nor disagree; 4 = I agree; 5 = I strongly agree).

Table 6. Structure of the 50-question Impact Measurement Tool

Dimension (scale)	What it measures	Developed by	Questions
Blue careers interest	Interest towards blue careers	Igor Vitale International (Italy)	10
Pro-environmental attitudes	Pro-environmental attitudes for ocean preservation	Lycée du Diadème Te Tara o Mai'ao (French Polynesia)	10
Pro-environmental behaviours	Pro-environmental behaviours for ocean preservation	Gozo College (Malta)	10
STEM university interest	Interest towards STEM university curricula related to blue careers	General High School of Sitia (Greece)	10
Ocean literacy	Ocean literacy	IIS Isa Conti Eller Vainicher (Italy)	10
Total	Five dimensions of the impact of the Blue Education Area	All partners	50

Scoring. For each student and each scale the ten answers are summed, so that every scale ranges from 10 to 50 (the “scale of 50 points” of the BlueOcean project). To compare scales and items on the same ruler, the report also uses the **mean item score** (scale score divided by 10, range 1–5), where 3 is the neutral point and 4 corresponds to “I agree”. Following Chapter 3, scale scores are classified as low (10–19), moderate (20–35) or high (36–50).

What each dimension tells the school. *Interest towards blue careers* captures how much students are attracted by marine, oceanic and coastal careers and see them as part of their future. *Pro-environmental attitudes* measure the value students give to the ocean and its protection, including the balance with economic development and the link with local identity. *Pro-environmental behaviours* move from values to actions, from avoiding harmful behaviours to taking part in clean-ups and applying what is learned. *Interest towards STEM university curricula* measures the intention to follow scientific and technical university studies (science, technology, engineering and mathematics) connected to the blue economy, the bridge between school and many blue professions. *Ocean literacy* measures agreement with the core principles of the ocean’s role for the planet and for people.

6. Methodology

6.1 Administration and sample

The questionnaire was administered online through Google Forms, in French in French Polynesia, Italian in Italy, Greek in Greece (with response labels in English) and English in Malta. Students could enter an anonymous code assigned by their school, in compliance with the General Data Protection Regulation; no names, ages or other personal data were requested.

Table 7. Administration of the Impact Measurement Tool by country

Country	Partner school	Language of the form	Data collection period	Questionnaires
French Polynesia	Lycée Diadème Te Tara o Mai'ao	French	2026-04-22 to 2026-04-28	53
Italy	IIS Isa Conti Eller Vainicher (Lipari)	Italian	2026-04-21	50

Country	Partner school	Language of the form	Data collection period	Questionnaires
Greece	General High School of Sitia	Greek	2026-04-20 to 2026-04-21	50
Malta	Gozo College	English	2026-10-09 to 2026-10-14	56
Total	4 partner schools	4 languages	April – October 2026	209

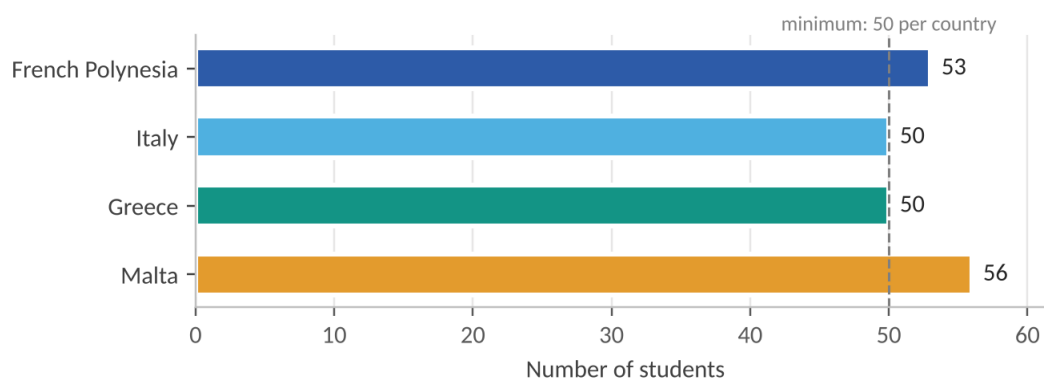


Figure 3. Number of students who completed the Impact Measurement Tool, by country. The dashed line marks the minimum of 50 students per country set by the project.

6.2 Data preparation and quality control

The four national data sets were merged into a single file with the same 50 variables, and each answer was converted into its numerical value (1–5). The following checks were carried out:

- **Missing answers.** Only 67 answers out of 10450 were missing (0.2%) and no student skipped more than 4 items. A scale score was computed when at least 8 of its 10 items were answered, by multiplying the mean of the answered items by 10.
- **Identification codes.** A few codes appear twice (three in French Polynesia, two in Malta) with different answers, which suggests mistyped codes rather than repeated submissions. In Greece all students entered the same placeholder code, so duplicates could not be checked. All questionnaires were retained.
- **Identical answers to all items.** 15 students (8 in French Polynesia, 5 in Greece, 2 in Malta) gave exactly the same answer to all 50 items (always “4” or always “5”), a possible sign of low engagement. They were kept in the main analysis and a check without them is presented in Section 11.
- **Italian version of the ocean literacy scale.** The Italian form did not include the item on the influence of the ocean on weather and repeated the item on the diversity of life. The duplicate was excluded and the Italian ocean literacy score is based on 9 items (prorated to the 10–50 range).

6.3 How to read the indicators used in this report

The report uses a small number of statistical indicators. They are explained here in plain terms, so that school directors and teachers can read the results and use the same indicators in their own school monitoring.

Mean item score (1–5). It is the average answer of the students to an item or to a scale. Values around 3 mean that students are, on average, undecided; values around 4 mean that they agree; values close to 5 mean strong agreement. For a school, it is the simplest way to see where students stand on each dimension and to compare dimensions with one another.

Scale score (10–50) and levels. Summing the ten answers of a scale gives a score from 10 to 50. Following Chapter 3, scores of 10–19 indicate a low level, 20–35 a moderate level and 36–50 a high level. The percentage of students in each level tells a school how many students are already strongly engaged and how many could still be reached.

Percentage of agreement. It is the share of students who answered “I agree” or “I strongly agree” to an item. It is often more intuitive than the mean: “71% of students want to learn more about ocean careers” is a sentence that can be shared directly with teachers, parents and partners.

Standard deviation (SD) and box plots. The standard deviation tells how much students differ from one another: a small SD means that the class or school is homogeneous, a large SD that some students are very engaged and others not at all. Box plots show the same information visually: the box contains the central half of the students and the line inside the box is the median. A large spread suggests that differentiated activities may be needed.

Cronbach’s alpha (reliability). It indicates whether the ten items of a scale measure the same thing consistently. It ranges from 0 to 1; values of .70 or more are considered acceptable and values above .80 good. A reliable scale gives a school confidence that differences between classes, schools or moments in time are real and not due to chance or to poorly worded questions.

Item-total correlation and first component. These indicators show whether each item “belongs” to its scale (item-total correlation) and whether the scale measures a single dimension (share of variance explained by the first principal component). They are mainly useful to the project to improve the instrument.

Statistical significance (p-value). When the report says that a difference between countries is “significant” ($p < .05$), it means that it is very unlikely to be the result of chance alone. Significance says that a difference exists, not how large it is.

Effect size (ϵ^2 and r). Effect sizes say how large a difference is. For differences among the four countries we use ϵ^2 (about .01 small, .06 medium, .14 or more large); for comparisons between two countries we use r (about .10 small, .30 medium, .50 large). A school director should pay most attention to differences that are both significant and at least medium in size.

Correlation (Spearman’s ρ). It shows whether two dimensions tend to go together: a value close to 0 means no relationship, values around .30 a moderate relationship and values above .50 a strong one. A correlation does not prove that one dimension causes the other, but it shows which aspects of students’ engagement grow together and can therefore be promoted together.

7. Can schools trust the tool? Psychometric quality of the five scales

All five scales show acceptable to excellent internal consistency in the pooled sample, with alpha values from .78 (pro-environmental attitudes) to .92 (interest towards STEM university curricula). The first principal component explains between 34% and 57% of the variance of each scale, supporting the use of one total score per scale.

Table 8. Internal consistency (Cronbach's alpha) by scale and country

Scale	French Polynesia	Italy	Greece	Malta	All countries [95% CI]
Blue careers interest	.93	.87	.89	.84	.90 [.87-.92]
Pro-environmental attitudes	.84	.85	.70	.66	.78 [.73-.82]
Pro-environmental behaviours	.88	.79	.86	.73	.84 [.81-.87]
STEM university interest	.92	.84	.93	.87	.92 [.90-.93]
Ocean literacy	.91	.83	.87	.87	.89 [.86-.92]

Note. Values below .70 are highlighted. Italy, ocean literacy: 9 questions. All countries, ocean literacy: computed on French Polynesia, Greece and Malta (n = 154).

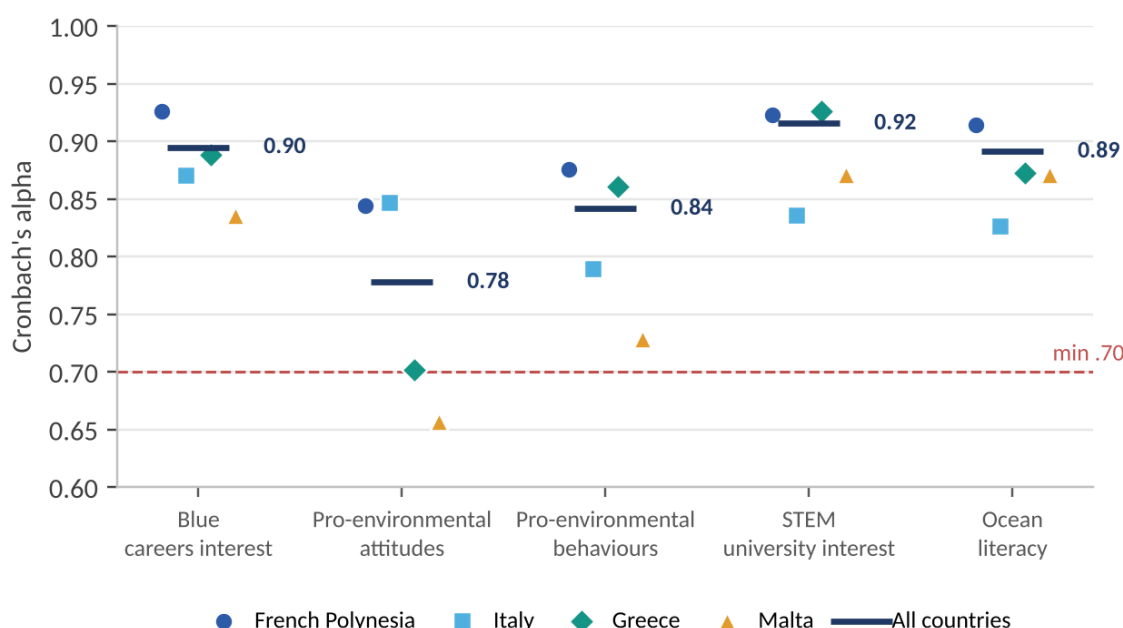


Figure 4. Cronbach's alpha of the five scales by country (symbols) and for the pooled sample (horizontal bar). The dashed line marks the minimum accepted value of .70.

At country level, 19 of the 20 coefficients reach .70. The only weak point is the pro-environmental attitudes scale in Malta ($\alpha = .66$) and, at the threshold, in Greece ($\alpha = .70$). This is mainly a ceiling effect: almost all students strongly agree with statements such as “Protecting the ocean is important for the well-being of my island and community”, and when everybody gives the same answer an instrument has little variability to work with.

What this means for teachers and school directors

The scores can be trusted and used for school decisions. With reliability values of this level, a school can use the five scales to compare classes, to identify the dimensions on which its students are weaker and to check whether the actions it takes are associated with better results. The tool can become part of the monitoring systems recommended by **Chapter 3, “Guideline 5 – Monitor, evaluate, and sustain motivation initiatives”** (p. 86), **Chapter 2, “Monitoring progress and maintaining engagement”** (p. 61) and the **Chapter 6, “10. Monitoring and Evaluation”** (p. 135) indicators.

Each scale gives a different message. Because the five scales are internally consistent and only partly overlapping, a school should not summarise them in a single number: a school can have students with excellent ocean values and still very low career intentions, and the actions needed are different.

Attitudes are already very high. Where almost all students agree that the ocean must be protected, the attitudes scale is less useful to show further progress. Schools in this situation should look mainly at behaviours, career interest and interest in scientific studies, where there is more room for growth.

The tool describes groups, not individual students. As Chapter 3 reminds us, the scales are not intended to “label” students. Individual results are best discussed by a guidance counsellor or psychologist within a career guidance conversation, never used to select or exclude students.

8. Results by scale

8.1 Overview

Table 9 and Figures 5 and 6 summarise the results. In the pooled sample, students show **high pro-environmental attitudes** (mean 4.15) and a **high level of ocean literacy** (4.13), both in the “agree” range. **Pro-environmental behaviours** are just below it (3.88), while **interest towards blue careers** (3.63) and especially **interest towards STEM university curricula** (3.44) lie between the neutral point and agreement.

Table 9. Scale scores (10–50) by country: mean (standard deviation) and mean item score

Scale	French Polynesia	Italy	Greece	Malta	All countries
Blue careers interest	41.5 (6.2) · 4.15	33.8 (6.3) · 3.38	34.8 (7.7) · 3.48	34.9 (6.9) · 3.49	36.3 (7.4) · 3.63
Pro-environmental attitudes	44.7 (3.7) · 4.47	40.7 (5.4) · 4.07	40.7 (5.4) · 4.07	39.9 (4.9) · 3.99	41.5 (5.2) · 4.15
Pro-environmental behaviours	42.9 (4.3) · 4.29	36.4 (5.2) · 3.64	37.0 (7.2) · 3.70	38.5 (5.5) · 3.85	38.8 (6.1) · 3.88
STEM university interest	40.4 (6.2) · 4.04	30.4 (6.6) · 3.04	31.4 (9.6) · 3.14	35.0 (6.9) · 3.50	34.4 (8.3) · 3.44
Ocean literacy	44.4 (4.7) · 4.44	39.2 (6.1) · 3.92	42.2 (6.6) · 4.22	39.5 (6.3) · 3.95	41.3 (6.3) · 4.13
Total (50 items, 50–250)	214.0 (20.8) · 4.28	179.6 (22.2) · 3.59	186.2 (28.8) · 3.72	187.8 (24.3) · 3.76	192.2 (27.4) · 3.84

Note. In each cell: mean scale score (SD) · mean item score on the 1–5 scale. Cells with a mean item score of 4.0 or more (the “agree” range) are highlighted in green.

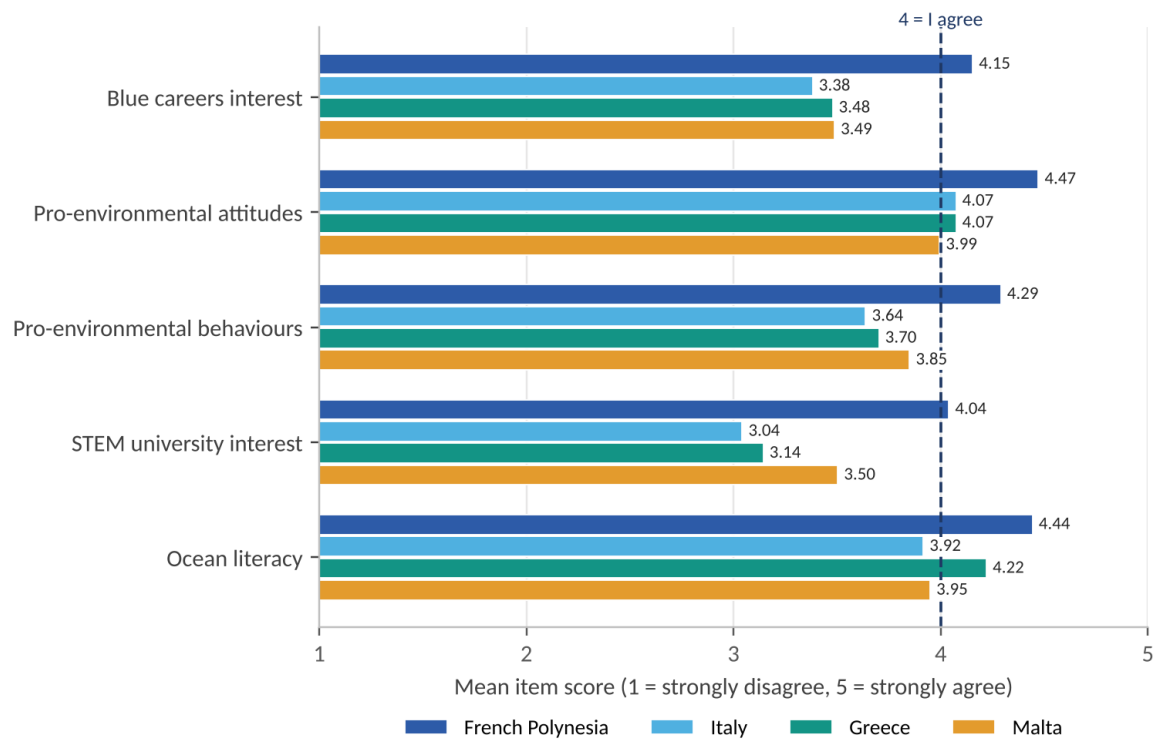


Figure 5. Mean item score of each scale by country. The dashed line marks the value 4 (“I agree”).

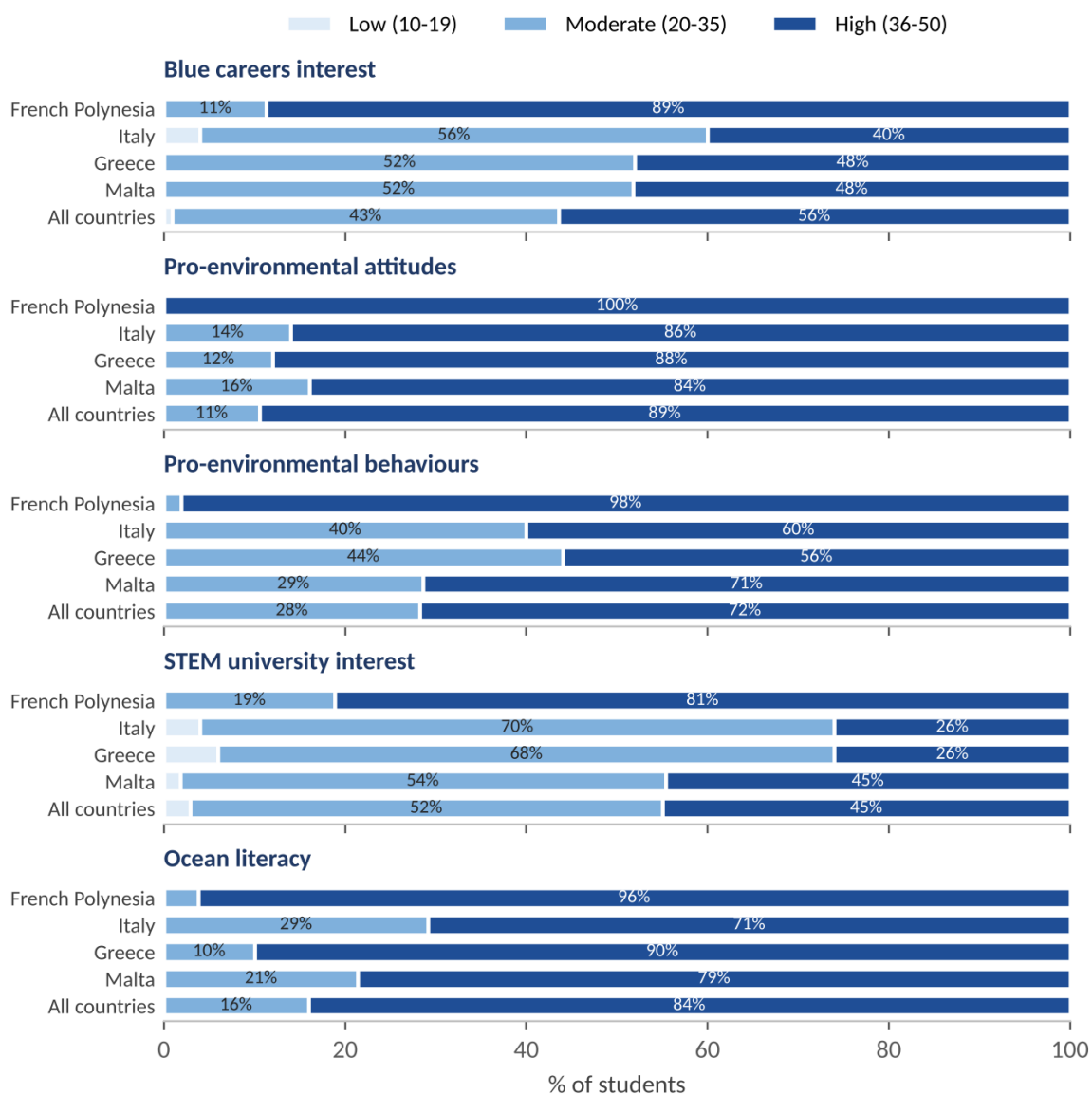


Figure 6. Distribution of students across the low (10–19), moderate (20–35) and high (36–50) levels defined in Chapter 3, by scale and country.

Very few students fall in the low range on any scale (at most 3% in the pooled sample). The share of students with a high score ranges from 45% for STEM university interest and 56% for blue careers interest to 84% for ocean literacy and 89% for pro-environmental attitudes.



What this means for the BlueOcean project

The project starts from a solid base of values and knowledge. The project was designed on the assumption that ocean topics are absent or marginal in school curricula. The data show that, in these four island schools, students already value the ocean and know its role. The most useful contribution of the Blue Education Area is therefore not to convince students that the ocean matters, but to **show them that the ocean can be their future.**

The gap that the project wants to reduce is visible in the data. BlueOcean aims to reduce the gap between school and work in coastal, marine and remote schools. The distance between attitudes (4.15) and STEM university interest (3.44) – almost three quarters of a point on a five-point scale – is the measurable form of this gap: what students value does not yet become a study or career plan.

The priorities are career guidance and scientific pathways. Among the guidelines of the previous chapters, those that make careers concrete (career guidance, encounters with professionals, internships, university outreach) should receive priority over those that only raise awareness. This is consistent with the BlueOcean Train the Teachers programme and with the EU-Pacific BlueOcean MOOC, which give teachers and students the content needed to make these pathways visible.

One instrument, a common language. For the first time the five partners share a common profile of their students, measured with the same instrument and the same scoring. This allows each school to position itself, to learn from partners with stronger results and to dialogue with local stakeholders on the basis of evidence.

8.2 Interest towards blue careers

Interest towards blue careers reaches a mean item score of 3.63, with 56% of students in the high range. Students are most attracted by the content of ocean careers: “Ocean science & innovation topics engaging” (72% of students agree), “Curious about ocean technology innovation” (71% of students agree) and “Want to learn about ocean careers” (71% of students agree). Agreement drops when students must project themselves into a concrete personal pathway: the lowest items are “Blue professions relevant to my career path” (40% of students agree), “Would choose a blue-economy study programme” (47% of students agree) and “Would seek blue-economy training/internships” (54% of students agree).

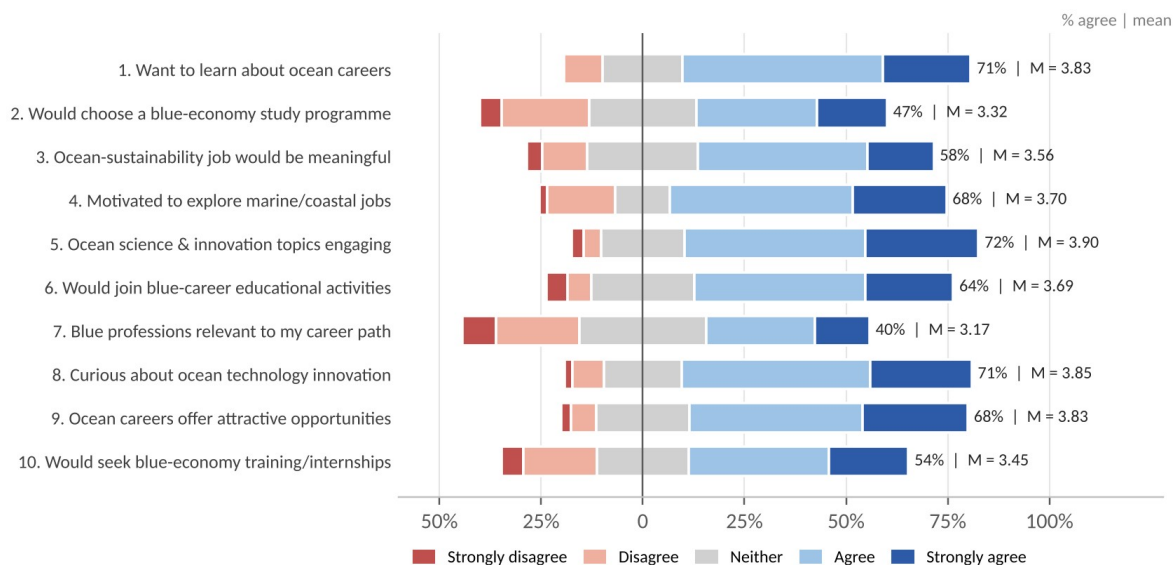


Figure 7. Interest towards blue careers: distribution of answers to each item, all countries (n = 209). Bars are centred on the neutral answer; the label shows the percentage of students who agree or strongly agree and the item mean.

French Polynesia is the only country whose average is in the “agree” range (4.15), with 89% of students in the high range. Italy (3.38), Greece (3.48) and Malta (3.49) show very similar moderate profiles, with about half of the students in the moderate range.

What this means. Students find the ocean interesting and believe that ocean careers are attractive (68% agree), but far fewer see these careers as *their* future. This is the “visibility paradox” described in Chapter 4: island students see the ocean every day, but they do not see the professional systems behind it, nor the concrete steps that lead from their school to those professions. The lowest items are precisely those that require information and personal guidance: which study programme, which training, which internship.



How the EU-Pacific Operational Guidelines can help: interest towards blue careers

- **Chapter 3, “Guideline 2 – Ensure access to professional career guidance and psychometric tools”** (p. 84–85): give every student access to a career counsellor or work and organisational psychologist, interest inventories and an individual career development portfolio started in middle school and updated every year. This directly addresses the weakest item, “relevant to my future career path”.
- **Chapter 2, “Ensuring structured career guidance”** (p. 57): combine short-term counselling (subject choices, internship selection) with long-term guidance (scholarships, university programmes, 5–10-year career mapping) and international internships within the EU-Pacific alliance.
- **Chapter 4, “Types of Blue Career School Events – Island Blue Career Fairs and Blue Speaker Series”** (p. 96–97) and objective 3.1 (pp. 97–98): every event should help students “identify at least one blue career that exists within their island economy and one that requires mobility beyond the island”.
- **Chapter 3, “Strategy 3 – Engage families and communities as partners”** (p. 82): parent workshops that dispel myths (“marine jobs are only for those who leave the island”, “ocean science doesn’t pay well”), job shadowing and virtual mentoring.
- **Chapter 3, “Guideline 3 – Promote partnerships with blue economy stakeholders”** (p. 85): a school “Blue Career Advisory Board” that brings employers and research centres into the school regularly.

What the school director can do

Appoint a Blue Careers team or committee (Chapter 2, p. 60; Chapter 3, Strategy 5, pp. 83–84), secure access to a guidance professional, include at least one blue career event per year in the school plan, and track the share of students who can name a blue career and the educational route to reach it.

8.3 Pro-environmental attitudes

Pro-environmental attitudes are the strongest dimension of the tool (mean 4.15; 89% of students in the high range; no student in the low range). The highest agreement concerns “Ocean protection matters for my community” (92% of students agree) and “Reefs and sharks deserve protection” (89% of students agree): the protection of the ocean is strongly linked to the well-being of the local island community. The relatively lowest items are “Studying the ocean raises its value to me” (72% of students agree) and “Learning makes conservation feel important” (77% of students agree).

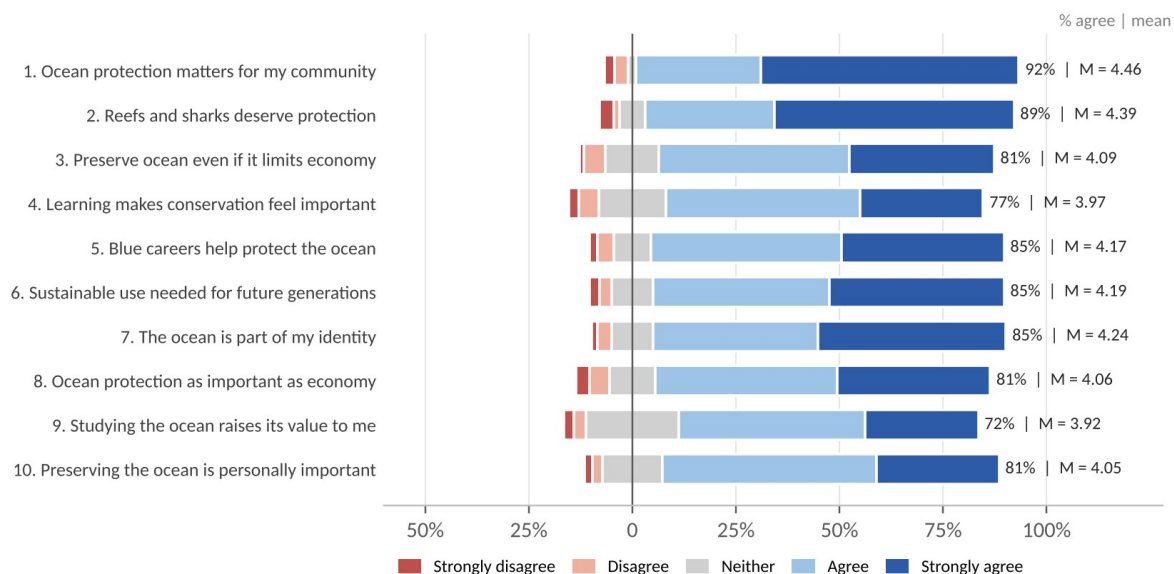


Figure 8. Pro-environmental attitudes for ocean preservation: distribution of answers to each item, all countries (n = 209). Bars are centred on the neutral answer; the label shows the percentage of students who agree or strongly agree and the item mean.

All four countries are in or very close to the “agree” range: French Polynesia 4.47, Italy 4.07, Greece 4.07 and Malta 3.99. In French Polynesia every student is in the high range. In Malta the item on the sustainable use of ocean resources for future generations is comparatively lower (average 3.79).

What this means. Ocean values are a resource that schools can count on, not a goal still to be reached. The fact that the lowest items concern the role of school learning (“studying the ocean increases its value in my eyes”, “learning about ocean topics makes me feel conservation is important”) suggests that students’ values come more from their island life and family than from school. The school’s task is to connect these values to what is studied in class and to what students can do.

How the EU-Pacific Operational Guidelines can help: pro-environmental attitudes

- **Chapter 1 (Lipari), “Foster Sustainability Values through Storytelling”** (p. 24–26): local legends, fishers’ stories and heritage (e.g., the women fishers of the Aeolian Islands) connect school learning with the emotional bond students already have with their sea.
- **Chapter 4, “Outdoor Education as Shared Scientific Practice”** (p. 104–105), in particular its “emotional and ethical dimensions of learning”: field experiences in which teachers and students explore the ocean together make the value of studying it tangible.
- **Chapter 5, “2.4 Immersive and Hands-On Field Events”** (p. 122): visits, clean-ups with monitoring and field work transform values into personal experience and learning.
- **Chapter 1 (Lipari), “Use Inquiry-Based and Experiential Learning”** (p. 28–29): water sampling, reef observation and biodiversity surveys show students that knowledge increases the value of what they protect.

What the school director can do

Use students’ strong ocean values as a lever, not as an end point: give visibility to these values in the school’s mission statement (Chapter 4, “Integrated School Policy Model”, p. 114) and make sure that every values-oriented activity is followed by a concrete action or a career connection.

8.4 Pro-environmental behaviours

Pro-environmental behaviours obtain a mean of 3.88 (72% of students in the high range). The scale shows a clear gradient between individual and collective actions. Individual, low-cost behaviours are the most frequent: “I avoid behaviours that harm marine life” (91% of students agree), “I practise sustainable use of resources” (80% of students agree) and “Willing to change my habits” (80% of students agree). Organised and pathway-oriented behaviours are less frequent: “I explore blue-career pathways” (57% of students agree), “I join ocean-protection learning activities” (63% of students agree) and “I take part in clean-ups / campaigns” (64% of students agree).

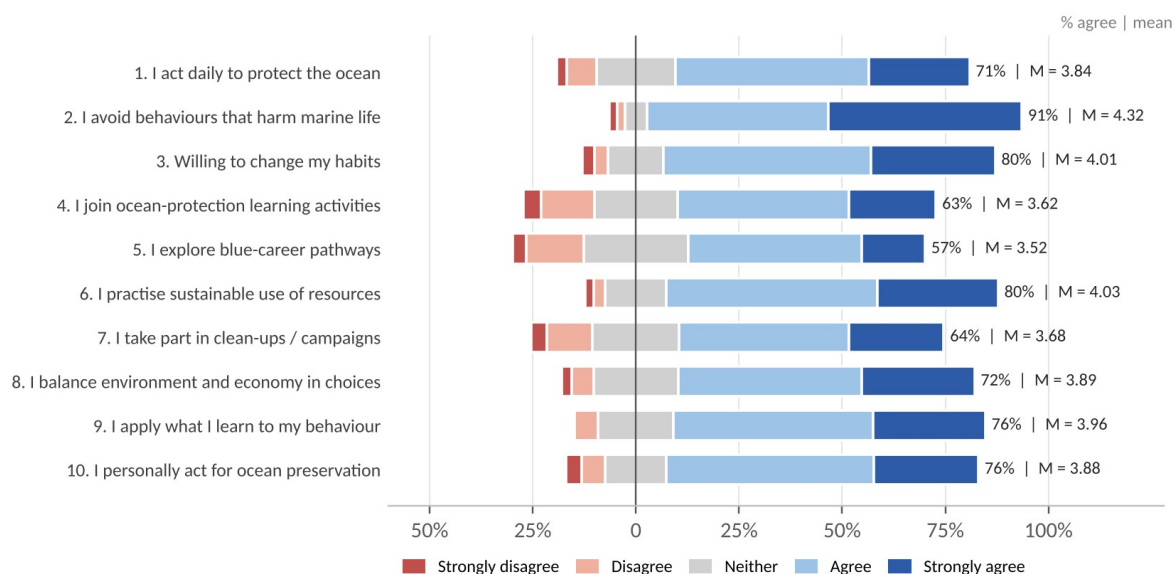


Figure 9. Pro-environmental behaviours for ocean preservation: distribution of answers to each item, all countries (n = 209). Bars are centred on the neutral answer; the label shows the percentage of students who agree or strongly agree and the item mean.

French Polynesia (4.29) is in the “agree” range, Malta (3.85) is close to it, while Greece (3.70) and Italy (3.64) are lower.

What this means. Students are willing to act, but their actions are mostly individual and private. Participation in organised activities depends on the opportunities that schools and communities offer: a student cannot join a clean-up, a citizen science project or a blue career activity if nobody organises it. The gap between willingness and participation is therefore largely an organisational gap, which school leadership can close.



How the EU-Pacific Operational Guidelines can help: pro-environmental behaviours

- **Chapter 1 (Lipari), “Encourage Student-Led Marine Projects”** (p. 26–27) and **Chapter 1 (Lipari), “Develop Local Blue Education Clubs”** (p. 29): plastic reduction campaigns, beach clean-ups with local organisations, permanent clubs that work with marine scientists and citizen science networks.
- **Chapter 4, “Policy Recommendations for School Leaders – 4. Citizen Science Integration Requirement”** (p. 106): at least one shared student-teacher data project every school year.
- **Chapter 4, “3.5 Student Leadership in Island Schools”** (p. 98): students as lagoon guides, reef data collectors and junior “blue ambassadors”, as in the Moana Ambassadors programme of French Polynesia (Chapter 1, pp. 6–7).
- **Chapter 5, “3.3 Phase 3 – Design the Event Programme”** (p. 124–125): every event closes with a concrete commitment (pledge board, class ocean action plan) and **Chapter 5, “3.6 Phase 6 – Evaluation and Follow-Up”** (p. 126) ensures that it is followed up.
- **Chapter 6, “19. Environmental Responsibility”** (p. 136): sustainable school practices, waste reduction and energy efficiency make the school itself a place where pro-environmental behaviour is practised.

What the school director can do

Turn occasional initiatives into a stable calendar of opportunities (a Blue Club, at least one citizen science project and one community action per year), recognise students’ participation (certificates, credits, visibility), and appoint a staff member as community partnership coordinator (Chapter 4, p. 110).

8.5 Interest towards scientific (STEM) university studies

Interest towards STEM university curricula related to blue careers is the weakest dimension (mean 3.44; 45% of students in the high range) and the one with the widest differences between students (SD = 8.3 points). Students recognise the usefulness of STEM education for the blue economy: “STEM training builds essential blue skills” (64% of students agree) and “STEM degrees lead to blue-economy jobs” (62% of students agree). The personal intention is much weaker: “I intend to pursue a STEM degree” (44% of students agree), “Marine STEM degree realistic for me” (45% of students agree) and “I see myself at science-tech-ocean crossroads” (52% of students agree). Only 52% of students consider their school science subjects relevant to ocean-related university studies.

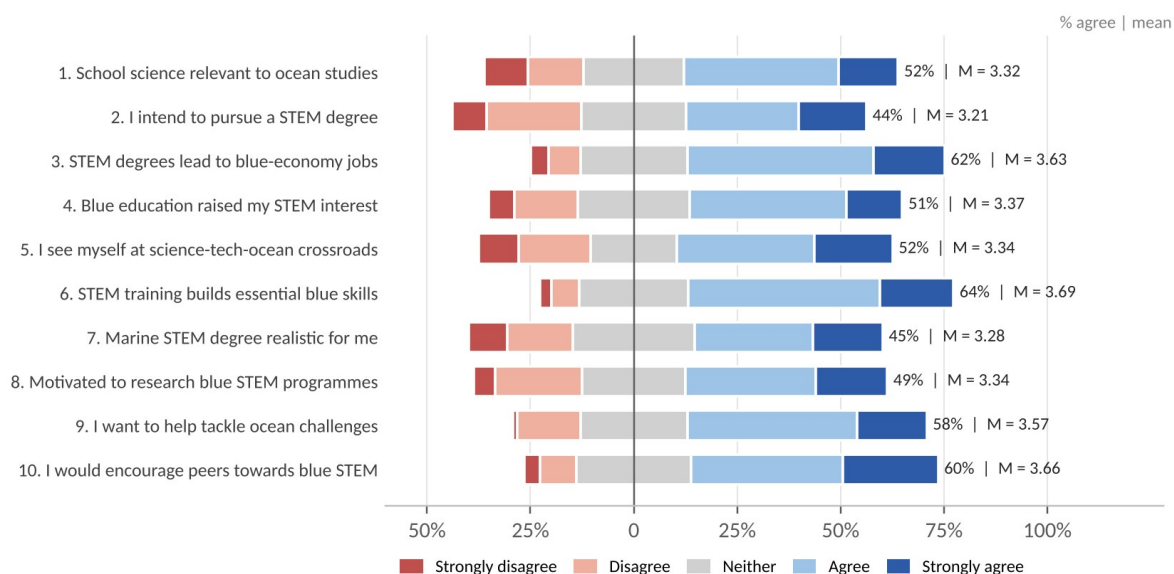


Figure 10. Interest towards STEM university curricula related to blue careers: distribution of answers to each item, all countries (n = 209). Bars are centred on the neutral answer; the label shows the percentage of students who agree or strongly agree and the item mean.

Country differences are the largest of the tool. French Polynesia reaches 4.04 and Malta 3.50, while Greece (3.14) and Italy (3.04) are around the neutral point of the scale; in these two countries only 26% of students are in the high range. In Greece only 30% of students see a link between school science and ocean-related university studies.

Why low interest in STEM is an emergency: the Union of Skills perspective

In March 2025 the European Commission launched the **Union of Skills** (COM(2025) 90), the EU strategy to equip people with the skills needed for a competitive, green and digital Europe, together with an **Action Plan on Basic Skills** and a **STEM Education Strategic Plan** (COM(2025) 89). The STEM Plan sets EU-level targets for 2030: reduce the share of 15-year-olds underachieving in mathematics and science to less than 15%; reach at least 45% of medium-level VET students and at least 32% of tertiary students in STEM fields, with at least one in four (VET) and two in five (tertiary) being women. The starting point is worrying: in PISA 2022 about 30% of European 15-year-olds did not reach basic proficiency in mathematics (up from about 23% in 2018) and 24% in science.

For the blue economy this is not an abstract problem. Most of the occupations described by BlueComp – from marine data analysis to coastal resilience and ecosystem-based management – require scientific and digital competences, and the EU Blue Economy Reports have repeatedly signalled skill shortages in STEM-related blue occupations. When students of island schools, who live next to the sea, do not intend to pursue STEM studies, the risk is double: the local blue economy will lack qualified people, and the few qualified jobs will be taken by people from outside, increasing the outmigration of young islanders.

From the teachers' perspective, the low interest in STEM is an emergency for at least three reasons. First, teachers see every day that disengagement from science starts well before university choices: when students do not see why school science matters (only 52% see its relevance for ocean studies), motivation and achievement decline together, feeding the underachievement that the Union of Skills wants to reduce. Second, teachers are often the only adults who can show island students a scientific



pathway: many families have no direct experience of university or of scientific professions, and without the school these pathways remain invisible. Third, the effects are cumulative and difficult to reverse: subject choices made at 14–16 close or open the doors to STEM degrees, so every year without action reduces the pool of students who can still choose a blue STEM pathway, and in the long run the pool of future science teachers as well.

How a school director can raise interest in scientific studies with the EU-Pacific Operational Guidelines

- **Make STEM locally meaningful.** Chapter 4, “STEM pathways in Island Blue Economies” (p. 99) asks schools to show the link between each scientific subject and a local role (marine biology → coral reef conservation technician; engineering → port infrastructure; data science → ocean monitoring) and to address isolation, mobility and identity barriers: “island identity is an asset, not a limitation”.
- **Bring universities into the school.** Chapter 5, “4.1 Integrating University Outreach into Event Programming” (p. 127): “Pathway Maps” from school subjects to degrees and blue careers, university lab demonstrations, information on scholarships and Erasmus+ funding, and “A Day in the Life” interviews with former students now at university.
- **Remove the barriers.** Chapter 5, “4.2 Addressing Barriers to Blue STEM Pathways” (p. 127–128): geographic, gender, academic-confidence and relevance barriers; in particular, teachers explicitly link their subjects to blue employers’ needs (chemistry → water quality; mathematics → ocean modelling; computer science → marine robotics), which addresses the weakest item D1.
- **Formalise co-teaching with scientists.** Chapter 4, “Policy Recommendations for School Leaders – 3. Partnership-Based Co-Teaching Agreements” (p. 106) and Chapter 4, “Scientist-Led Classroom Co-Teaching” (p. 102): structured agreements with universities and marine institutes.
- **Build a progression, not a single event.** Chapter 2, “From primary to secondary and beyond” (p. 56) avoids “late and rushed career decisions”; Chapter 3, “Strategy 2 – Strengthen career guidance services and psychometric assessments” (p. 81–82) uses aptitude and interest data to recommend targeted STEM workshops when gaps emerge.
- **Use mobility as a motivator.** Chapter 4, “International Exchanges and European Mobility” (p. 112–113): exchanges and joint marine science camps “increase motivation for STEM pathways”; virtual exchanges are especially valuable for remote islands.
- **Monitor what matters.** Include “STEM integration” and “Gender balance in STEM” among the school indicators (Chapter 6, “5. Curriculum Integration Indicators and 13. Inclusion and Diversity” (p. 133–135)) and track student aspirations towards STEM and blue careers as required by the Chapter 4, “Integrated School Policy Model – 5. Evaluation Framework” (p. 114).

For Italy and Greece, where interest is lowest, the priority is the **relevance barrier**: showing why school science matters for the ocean and for local jobs. For Malta, where the profile is more favourable, it is to keep the momentum through university partnerships. The data set does not record students’ age; where respondents are younger (Gozo College’s secondary schools serve students aged 13 to 16), university intentions are naturally less defined, and early, progressive guidance is especially important.

8.6 Ocean literacy

Ocean literacy is high (mean 4.13; 84% of students in the high range). The best known principles concern ocean biodiversity and the still unexplored nature of the ocean: “Ocean supports great

diversity of life” (86% of students agree), “The ocean is largely unexplored” (81% of students agree) and “Ocean supports great diversity of ecosystems” (86% of students agree). Less consolidated are “Ocean produces 50-80% of Earth’s oxygen” (70% of students agree) and “Earth has one big ocean” (75% of students agree), which refer to more specific scientific notions.

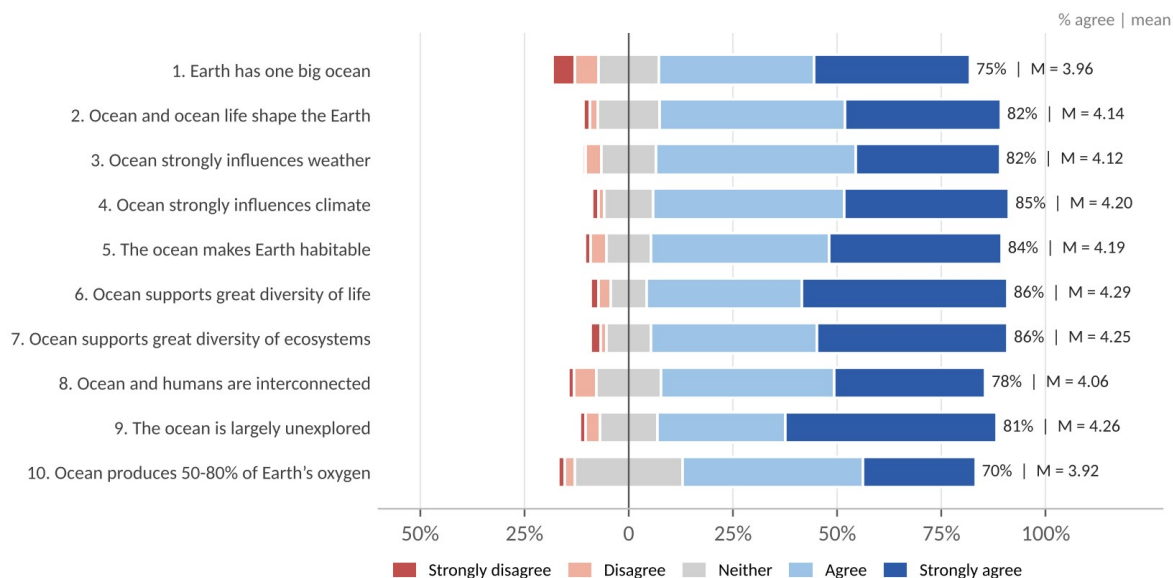


Figure 11. Ocean literacy: distribution of answers to each item, all countries (n = 209; the question on weather excludes Italy). Bars are centred on the neutral answer; the label shows the percentage of students who agree or strongly agree and the item mean.

French Polynesia (4.44) and Greece (4.22) are in the “agree” range, while Malta (3.95) and Italy (3.92) are just below it.

What this means. Students share the main principles of ocean literacy, which corresponds to the first competence of BlueComp (A.1). Two aspects deserve attention: the more scientific principles (the ocean as a single interconnected system, its contribution to oxygen production) are less consolidated, and, as Section 10 shows, ocean literacy is only moderately linked to career and STEM interest. Knowledge is necessary but, alone, it does not open a pathway.



How the EU-Pacific Operational Guidelines can help: ocean literacy

- **Chapter 3, “Guideline 1 – Adopt a whole-school ocean literacy framework”** (p. 84) and **Chapter 2, “Integrating ocean themes across all subjects”** (p. 53–54): every subject and grade contributes (e.g., coral bleaching in biology at Lycée Diadème, Mediterranean shipping routes in geography in Sitia, real fishing data in mathematics at Gozo College).
- **Chapter 4, “Policy Recommendations for School Leaders – 1. Mandatory Annual Teacher Field Training and 2. Embedded Professional Learning Communities”** (p. 106), building on the model of the **Chapter 4, “teacher as co-researcher”** (p. 100–101).
- **Chapter 5, “2.2 Ocean Science Days and Environmental Awareness Events”** (p. 121), with the rule of **Chapter 4, “Ocean Science Days in Island Ecosystems”** (p. 96): “every field activity must explicitly connect to a career role on the island”. This turns literacy into career awareness.
- **Chapter 1 (Lipari), “A Scale of Measurement for Identifying Ocean Literacy”** (p. 33–36): a short instrument that schools can use periodically to follow students’ ocean literacy over the school year.

What the school director can do

Include ocean literacy goals in the annual school plan, recognise fieldwork as valid teaching time (Chapter 4, p. 105) and make sure that ocean topics are not confined to science lessons but are linked, in every subject, to the people and jobs that work with the ocean.

9. Cross-country comparison

The differences between countries are statistically significant for all five scales (Table 10). Effect sizes are large for interest towards blue careers, pro-environmental behaviours and STEM university interest, and medium for pro-environmental attitudes and ocean literacy. French Polynesia scores significantly higher than all other countries on career interest, attitudes and behaviours; for STEM interest, Malta also scores higher than Italy and Greece; for ocean literacy, Greece scores higher than Italy and Malta.

How to read Table 10. The Kruskal-Wallis test answers a simple question: do the students of the four schools give systematically different answers on a dimension, or are the differences we see just due to chance? Instead of comparing averages, it ranks all students from the lowest to the highest score and checks whether the students of one school tend to sit higher or lower in this ranking; for this reason it remains reliable when, as here, many answers are concentrated near the top of the scale. The table is read from left to right. **H** summarises how far apart the four schools are: the larger the value, the larger the differences. **p** tells whether the differences could be due to chance: below .05 they are considered real, and “ $p < .001$ ” means that chance can be practically excluded. ϵ^2 (epsilon squared) shows how important the differences are: about .01 is small, .06 medium and .14 or more large. The **last column** lists which pairs of schools differ, with the difference in points on the 10–50 scale (Δ) and its size (r: about .10 small, .30 medium, .50 large). For example, for interest towards blue careers $H = 45.3$, $p < .001$ and $\epsilon^2 = .21$: the schools differ clearly and strongly, and the pairwise comparisons show that it is the students of Tahiti who stand apart, with scores about 7 points higher than those of the other three schools, which do not differ significantly from one another.

Table 10. Differences between countries: Kruskal-Wallis tests and significant pairwise comparisons

Scale	Kruskal-Wallis H (df = 3)	p	ε^2	Significant pairwise differences (Holm-adjusted $p < .05$)
Blue careers interest	45.3	$p < .001$	.21	French Polynesia–Italy ($\Delta = 7.7$ points, $r = .57$); French Polynesia–Greece ($\Delta = 6.8$ points, $r = .49$); French Polynesia–Malta ($\Delta = 6.7$ points, $r = .53$)
Pro-environmental attitudes	28.1	$p < .001$	.12	French Polynesia–Italy ($\Delta = 4.0$ points, $r = .37$); French Polynesia–Greece ($\Delta = 4.0$ points, $r = .39$); French Polynesia–Malta ($\Delta = 4.8$ points, $r = .48$)
Pro-environmental behaviours	38.9	$p < .001$	.18	French Polynesia–Italy ($\Delta = 6.5$ points, $r = .57$); French Polynesia–Greece ($\Delta = 5.9$ points, $r = .46$); French Polynesia–Malta ($\Delta = 4.4$ points, $r = .40$)
STEM university interest	51.1	$p < .001$	.23	French Polynesia–Italy ($\Delta = 10.0$ points, $r = .66$); French Polynesia–Greece ($\Delta = 9.0$ points, $r = .48$); French Polynesia–Malta ($\Delta = 5.4$ points, $r = .39$); Italy–Malta ($\Delta = 4.6$ points, $r = .34$); Greece–Malta ($\Delta = 3.6$ points, $r = .25$)
Ocean literacy	26.1	$p < .001$	.11	French Polynesia–Italy ($\Delta = 5.3$ points, $r = .42$); French Polynesia–Malta ($\Delta = 4.9$ points, $r = .40$); Italy–Greece ($\Delta = 3.0$ points, $r = .27$); Greece–Malta ($\Delta = 2.7$ points, $r = .24$)
Total score (50 items)	51.1	$p < .001$	.24	French Polynesia–Italy ($\Delta = 34.4$ points, $r = .63$); French Polynesia–Greece ($\Delta = 27.8$ points, $r = .52$); French Polynesia–Malta ($\Delta = 26.2$ points, $r = .52$)

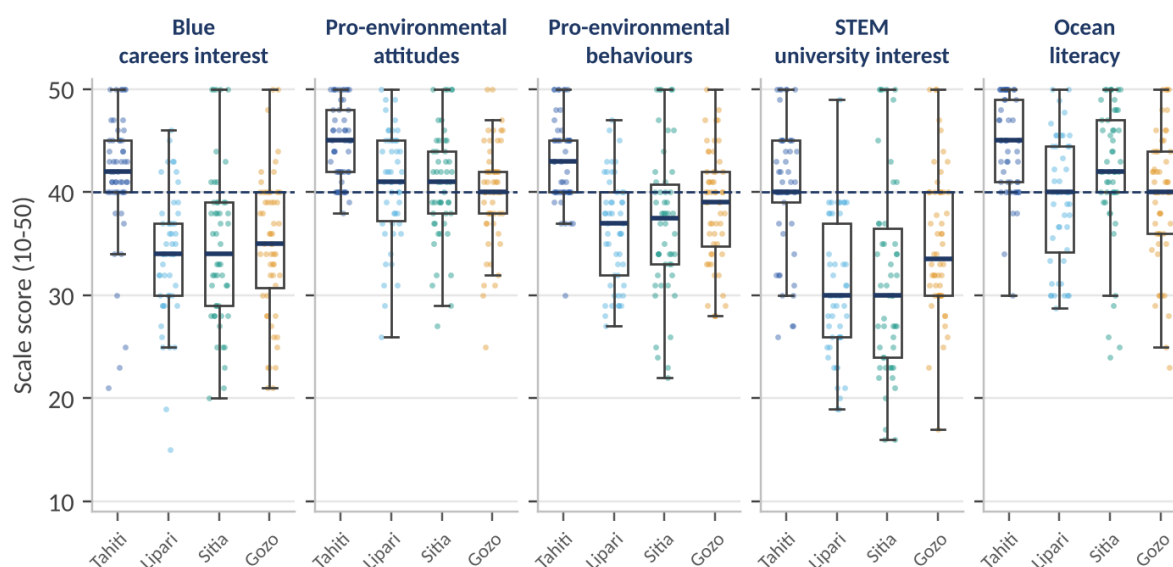


Figure 12. Distribution of individual scale scores by country (schools of Tahiti, Lipari, Sitia and Gozo). Boxes show the median and the central half of the students; dots are individual students; the dashed line marks 40/50 (mean item score of 4).

The higher scores of French Polynesian students are consistent with the strong place-based identity and with the long-standing marine education initiatives of the territory described in Section 3.1 (Educational Marine Areas, Moana Ambassadors, a dense NGO network). They should, however, be read with some caution, because French Polynesia also has the highest number of students who gave the same answer to all items (8 of 53); Section 11 shows that the ranking does not change when these students are excluded. Figure 13 shows all 50 item means by country and can be used by each school to identify its own strengths and priorities.

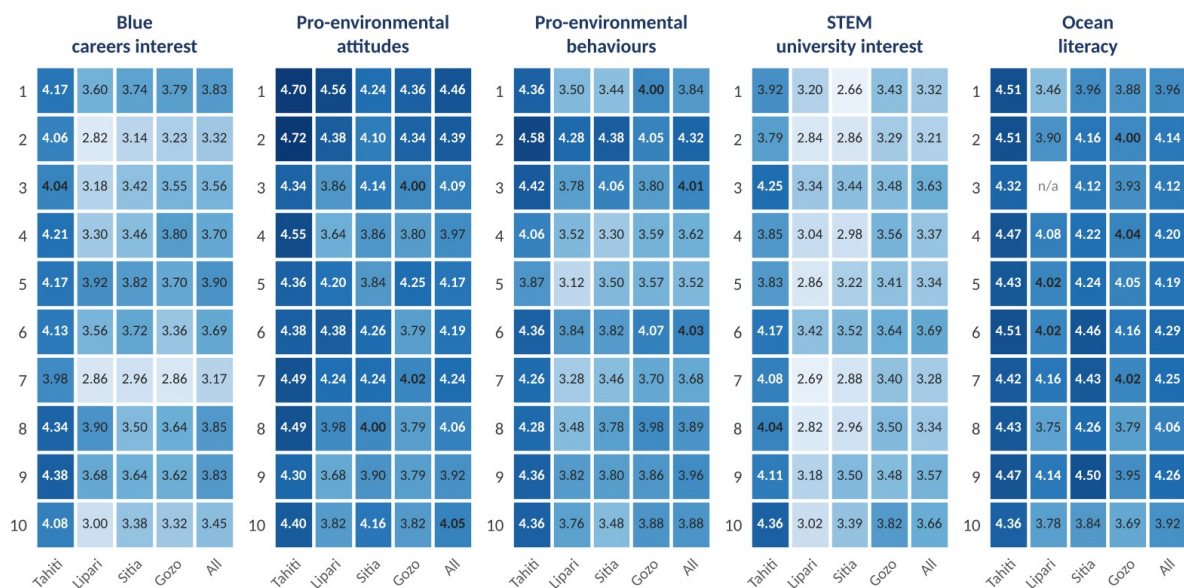


Figure 13. Mean score of each item by country. Darker cells indicate higher agreement; values of 4 or more (“agree”) are in bold. The question on weather was not administered in Lipari.

What this means for school directors

Learning from the partners is the fastest way to improve. Each school has at least one dimension in which another partner is stronger. The **Chapter 2, “Building partnerships with the Blue economy – International partnerships”** (p. 58) and the **Chapter 4, “Professional Learning Communities (PLCs) for Blue Education”** (p. 104) – including island-to-island networks between Malta, Greece, Italy and French Polynesia – are the natural channels to transfer practices such as the Educational Marine Areas and the Moana Ambassadors.

Exchanges are also a result in themselves. Student and teacher exchanges (**Chapter 4, “International Exchanges and European Mobility”** (p. 112–113); international internships in **Chapter 2, “Ensuring structured career guidance”** (p. 57)) show students that ocean challenges and careers are global, which is particularly relevant for the dimensions where the European partners are weaker (career interest and interest in scientific studies).

Comparisons should be used to learn, not to rank. Schools differ in age of students, curricula and context (Section 3). The comparison is useful to identify practices worth exploring, not to judge schools.

10. Relationships among the five dimensions

All five scales are positively and significantly correlated (all $p < .001$, $n = 207$). The strongest association links **interest towards blue careers** and **interest towards STEM university curricula** ($p = .78$). Pro-environmental behaviours are strongly related both to career interest ($p = .71$) and to STEM interest ($p = .72$). Ocean literacy is more closely related to attitudes ($p = .60$) than to career interest ($p = .45$) and STEM interest ($p = .41$).

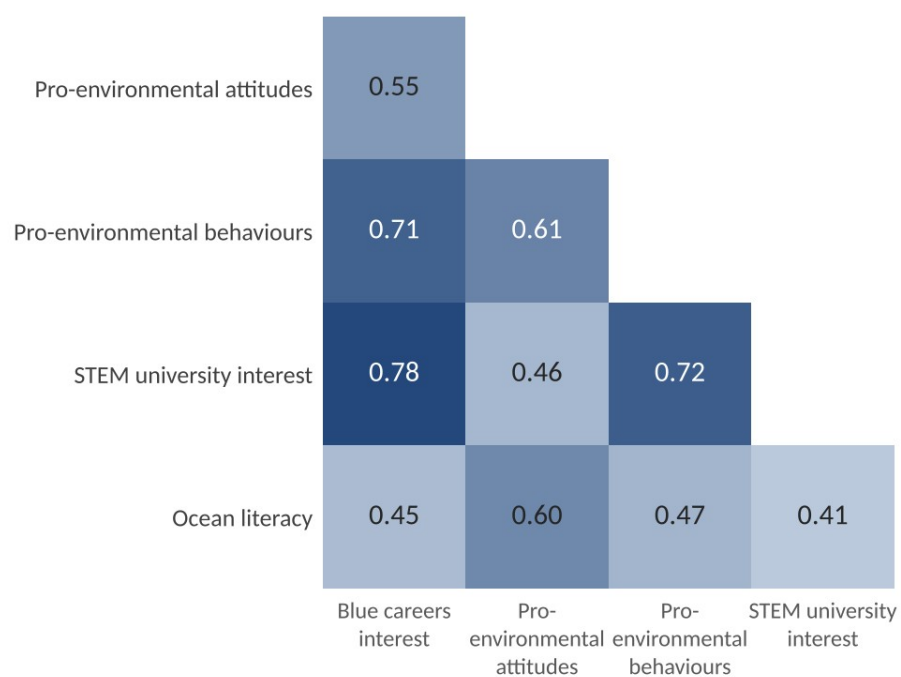


Figure 14. Spearman correlations among the five scale scores (all countries, $n = 207$).

Correlations do not prove that one dimension causes another, but they show which aspects of student engagement grow together. For a school director, this has four practical implications.

What a school director can do with these relationships

1. Career guidance and STEM orientation should be one pathway (a strong link)

Students who are interested in blue careers are also those who consider a STEM degree, and vice versa. Schools should not run career guidance and university orientation as separate activities. A single “blue pathway” – career portfolio (Chapter 3, Guideline 2, pp. 84–85), Pathway Maps from school subjects to degrees and jobs (Chapter 5, 4.1, p. 127), university and employer partners in the same events – is likely to strengthen both.

2. Doing leads to choosing (strong links)

Students who act for the ocean are also those most interested in blue careers and STEM studies. Active formats – citizen science, Blue Clubs, competitions and innovation challenges (Chapter 4, Policy Recommendation 4, p. 106; Chapter 4, “Competitions and Island Innovation Challenges”, p. 97; Chapter 5, 2.5, p. 123) – are therefore not only environmental education: they are career orientation. A director should give them a stable place in the school year and make sure that each one includes a moment of reflection on the related professions.

3. Knowledge must be translated into roles and people (only moderate links)

Knowing about the ocean is only moderately linked to wanting to work with it. Ocean literacy lessons should always include “who does this job?”: the rule of Chapter 4 that every field activity must connect to a career role on the island (p. 96), the “Linking Conservation to Careers” element of Ocean Science Days (Chapter 5, p. 121) and the presence of professionals in class (Chapter 2, “a researcher in the classroom”, p. 57) are simple ways to do it.

4. Knowledge feeds values, and values can feed action (strong links)

Ocean literacy is closely associated with the value students give to the ocean, and values with behaviours. A whole-school ocean literacy framework (Chapter 3, Guideline 1, p. 84) therefore supports the whole chain, provided that values are always followed by concrete opportunities to act.

In practice: when planning the school year, the director can check that each blue activity touches at least two links of the chain – knowledge, action, career, study pathway – as suggested by the four model objectives of Chapter 5, Phase 1 (pp. 123–124): one ocean literacy objective, one career awareness objective, one STEM university objective and one behavioural objective.

11. Robustness check

All analyses were repeated after excluding the 15 students who gave the same answer to all 50 items ($n = 194$). The conclusions remain unchanged: mean item scores change by less than 0.15 points, all scales keep an alpha of at least .74 in the pooled sample and the differences between countries remain significant with similar effect sizes. The reliability of the attitudes scale in Greece decreases, which confirms the need to strengthen that scale.

Table 11. Main results with and without identical answers to all items

Scale	Mean item score – all students	Mean item score – excluding identical answers	Alpha – all students	Alpha – excluding identical answers	Country effect ϵ^2 – all / excluding
Blue careers interest	3.63	3.54	.90	.87	.21 / .21
Pro-environmental attitudes	4.15	4.11	.78	.74	.12 / .14

Scale	Mean item score – all students	Mean item score – excluding identical answers	Alpha – all students	Alpha – excluding identical answers	Country effect ϵ^2 – all / excluding
Pro-environmental behaviours	3.88	3.81	.84	.81	.18 / .19
STEM university interest	3.44	3.34	.92	.90	.23 / .25
Ocean literacy	4.13	4.09	.89	.88	.11 / .10

12. Achievement of the project indicators

Table 12 compares the results with the project indicators that concern the Impact Measurement Tool and its administration. All of them are achieved; reliability is fully satisfactory at pooled level and in 19 of 20 country-level values.

Table 12. Achievement of the project indicators related to the Impact Measurement Tool

Indicator	Target	Result	Status
Impact Measurement Method for measuring students' interest in blue careers	50 questions in 5 scales	50 questions, 5 scales of 10 questions, 4 language versions	Achieved
Administration of the Impact Measurement Tool	≥ 200 students	209 students	Achieved
Administration per country	≥ 50 students per country	FR 53; IT 50; GR 50; MT 56	Achieved
Reliability of the scales	Cronbach's alpha ≥ .70	Pooled: .78–.92; 19 of 20 country values ≥ .70	Achieved
Data analysis and reports at national and EU level	Analysis and report	This report (country and pooled results)	Achieved

13. Implications for school directors: from results to action

The results of the four schools point to a consistent message for school directors and school policy makers: the Blue Education Area does not need to start from zero, because students already value the ocean and know its importance; it needs to build the bridges between these values and students' future. Without a school policy, as Chapter 4 warns, blue education remains “a series of disconnected events” that depend on individual teachers. With a school policy, it becomes part of the school's identity, of its curriculum and of its guidance system. Table 13 brings together the main priorities that emerge from the data and the guidelines that a director can activate for each of them.

Table 13. Action plan for school directors: priorities, evidence and the EU-Pacific Operational Guidelines

Priority	What the data show	Where to find help in the Guidelines	First steps for the school director
1. Make blue careers personally relevant	Only 40% see blue professions as relevant to their own career path; 47% would choose a blue-economy study programme	Chapter 3, Guideline 2 (pp. 84–85); Chapter 2, structured career guidance (p. 57); Chapter 4, Island Blue Career Fairs and Speaker Series (pp. 96–97)	Secure access to a career counsellor or psychologist; start individual career portfolios; one blue career event per year

Priority	What the data show	Where to find help in the Guidelines	First steps for the school director
2. Open STEM university pathways	Lowest dimension (3.44 out of 5); only 44% intend a scientific degree; 52% see school science as relevant to ocean studies	Chapter 5, Section 4 (pp. 126–128); Chapter 4, STEM pathways in island blue economies (p. 99) and Co-Teaching Agreements (p. 106)	Sign at least one agreement with a university or marine institute; ask each science teacher to link one unit to a blue job and degree
3. From willingness to organised action	Exploring blue pathways 57%; learning activities 63%; clean-ups and campaigns 64%	Chapter 1, student-led projects and Blue Clubs (pp. 26–29); Chapter 4, Citizen Science Requirement (p. 106) and student leadership (p. 98)	Create a Blue Club; plan one citizen science project per year; recognise student participation
4. Literacy with a career connection	High ocean literacy (4.13 out of 5), but only moderately linked to career interest	Chapter 3, Guideline 1 (p. 84); Chapter 4, Ocean Science Days (p. 96), teacher field training and professional learning communities (p. 106)	Add ocean literacy goals to the school plan; require a "who does this job?" moment in every ocean activity
5. Institutionalise and monitor	A reliable questionnaire is now available to every school	Chapter 4, Integrated School Policy Model (p. 114); Chapter 6, checklist and implementation steps (pp. 133–136); Chapter 3, Guideline 5 (p. 86)	Include blue education in the mission statement and annual plan; appoint a Blue Education coordinator; use the five scales and the Chapter 6 checklist each year

Leadership as the condition for everything else

The Chapter 6 indicator checklist shows that the first pre-requirement of a Blue Education Area is **governance and leadership**: blue education in the school strategy, a Blue Education coordinator, visible leadership commitment and alignment with EU policies (p. 133). The Integrated School Policy Model of Chapter 4 (p. 114) translates this into five components – institutional commitment, partnership structure, curriculum integration, mobility strategy and evaluation framework – and the three-layer funding model (p. 113) helps to sustain them with local, national and European resources. The results of this report suggest where to place the emphasis: on the partnership structure and the guidance system, which are the components most directly connected with the weakest dimensions (career and STEM interest).

Improving the instrument

- **Correct the Italian version** of the ocean literacy scale by restoring the item on the influence of the ocean on weather and removing the duplicate item.
- **Strengthen the attitudes scale** with two or three more demanding items (e.g., trade-offs between personal convenience and ocean protection) to reduce the ceiling effect observed in Malta and Greece.
- Use **unique anonymous codes** in all schools and add a few background variables (age, gender, school year, track), so that schools can compare like with like.
- Add a short **attention-check item** and give students enough time to complete the 50 items.

14. Limitations

The results should be read in the light of some limitations. The samples include about 50 students from one school per country and are not representative of national student populations. The questionnaire was administered in April 2026 in French Polynesia, Italy and Greece and in October 2026 in Malta, at different points of the school year. The language versions were not formally tested for equivalence,

and the Italian ocean literacy scale differs by one item. The absence of demographic variables does not allow controlling for age or school track, which may partly explain the differences between countries. Finally, this report describes the results of the experimentation phase; changes over time will be analysed in a separate report on a further set of data.

Conclusion

The BlueOcean Impact Measurement Tool proved to be a reliable and practical instrument: 209 students in four island schools completed all five scales, and all scales reached the required level of reliability. The students of Tahiti, Lipari, Sitia and Gozo care about the ocean (mean 4.15) and know its role for the planet (4.13), are willing to act for it (3.88), but are still uncertain about blue careers (3.63) and blue STEM university pathways (3.44) as a personal choice. In the language of BlueComp, the foundations of ocean literacy and sustainability are in place, while the motivation to enter the scientific and professional pathways of the blue economy is still fragile – a fragility that the Union of Skills identifies as one of Europe’s main challenges.

This is exactly the space in which the EU-Pacific Operational Guidelines can make a difference, and in which school directors play the decisive role: by turning occasional initiatives into school policy, by opening the school to universities, employers and communities, by giving every student access to guidance, and by monitoring the results with the tool presented here.

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Annex – Item-level statistics by country

The following tables report, for each item, the mean score in each country and in the pooled sample, and the percentage of all students who agree or strongly agree (answers 4 or 5). Means of 4.0 or above (“agree”) are highlighted in green.

Table 14. Interest towards blue careers

Question	Tahiti	Lipari	Sitia	Gozo	All	% agree
1. I am interested in learning more about careers related to the ocean and marine environments.	4.17	3.60	3.74	3.79	3.83	71%
2. I would consider choosing a study program connected to blue economy sectors.	4.06	2.82	3.14	3.23	3.32	47%
3. Working in a profession related to ocean sustainability would be personally meaningful to me.	4.04	3.18	3.42	3.55	3.56	58%
4. I feel motivated to explore job opportunities linked to marine or coastal activities.	4.21	3.30	3.46	3.80	3.70	68%
5. I find topics related to ocean science and marine innovation engaging.	4.17	3.92	3.82	3.70	3.90	72%
6. I would like to participate in educational activities focused on blue careers.	4.13	3.56	3.72	3.36	3.69	64%
7. I see blue economy professions as relevant to my future career path.	3.98	2.86	2.96	2.86	3.17	40%
8. I am curious about how technological innovation can support ocean-related industries.	4.34	3.90	3.50	3.64	3.85	71%
9. I believe that careers connected to the ocean can offer attractive professional opportunities.	4.38	3.68	3.64	3.63	3.83	68%
10. I would actively seek information about training or internships in blue economy sectors.	4.08	3.00	3.38	3.32	3.45	54%

Table 15. Pro-environmental attitudes for ocean preservation

Question	Tahiti	Lipari	Sitia	Gozo	All	% agree
1. Protecting the ocean is important for the well-being of my island and community.	4.70	4.56	4.24	4.36	4.46	92%
2. Marine ecosystems such as coral reefs and sharks are valuable and deserve protection.	4.72	4.38	4.10	4.34	4.39	89%
3. The ocean should be preserved even if it limits certain economic activities.	4.34	3.86	4.14	4.00	4.09	81%
4. Learning about ocean-related topics makes me feel that marine conservation is important.	4.55	3.64	3.86	3.80	3.97	77%
5. Blue careers (e.g., marine biology, sustainable tourism) play an important role in protecting the ocean.	4.36	4.20	3.84	4.25	4.17	85%
6. Sustainable use of ocean resources is necessary for future generations.	4.38	4.38	4.26	3.79	4.19	85%
7. I believe that the ocean around my island is an important part of my identity and heritage.	4.49	4.24	4.24	4.02	4.24	85%
8. Environmental protection of the ocean is as important as economic development.	4.49	3.98	4.00	3.79	4.06	81%
9. Studying and understanding the ocean increases its value in my eyes.	4.30	3.68	3.90	3.79	3.92	72%
10. The idea of preserving the ocean is important to me personally.	4.40	3.82	4.16	3.82	4.05	81%

Table 16. Pro-environmental behaviours for ocean preservation

Question	Tahiti	Lipari	Sitia	Gozo	All	% agree
1. I take actions in my daily life to protect the ocean and my local marine environment.	4.36	3.50	3.44	4.00	3.84	71%
2. I avoid behaviors that harm marine ecosystems (e.g., littering, disturbing marine life, supporting harmful products).	4.58	4.28	4.38	4.05	4.32	91%
3. I am willing to change my habits (e.g., consumption, waste, energy use) to reduce my impact on the ocean.	4.42	3.78	4.06	3.80	4.01	80%
4. I actively participate in learning activities (school, community, or personal) related to ocean protection.	4.06	3.52	3.30	3.59	3.62	63%
5. I explore or consider engaging in activities or pathways related to blue careers (e.g., marine science, conservation, sustainable tourism).	3.87	3.12	3.50	3.57	3.52	57%
6. I support or practice sustainable use of ocean resources (e.g., reducing waste, choosing sustainable seafood, conserving water).	4.36	3.84	3.82	4.07	4.03	80%
7. I take part in activities that protect or promote my island's or community's marine environment (e.g., clean-ups, awareness campaigns, conservation actions).	4.26	3.28	3.46	3.70	3.68	64%
8. When possible, I make choices that balance environmental protection with economic activities (e.g., supporting sustainable tourism or local eco-friendly businesses).	4.28	3.48	3.78	3.98	3.89	72%
9. I apply what I learn about the ocean to my behavior (e.g., changing habits, sharing knowledge, making informed decisions).	4.36	3.82	3.80	3.86	3.96	76%
10. I personally take actions to contribute to ocean preservation (e.g., reducing plastic use, participating in conservation efforts, raising awareness).	4.36	3.76	3.48	3.88	3.88	76%

Table 17. Interest towards STEM university curricula related to blue careers

Question	Tahiti	Lipari	Sitia	Gozo	All	% agree
1. My school science subjects are relevant to ocean-related university studies.	3.92	3.20	2.66	3.43	3.32	52%
2. I intend to pursue a STEM degree at university level.	3.79	2.84	2.86	3.29	3.21	44%
3. STEM university programs lead to concrete career opportunities in the blue economy.	4.25	3.34	3.44	3.48	3.63	62%
4. Blue education activities at school have strengthened my interest in STEM studies.	3.85	3.04	2.98	3.56	3.37	51%
5. I can see myself working professionally at the intersection of science, technology, and the ocean.	3.83	2.86	3.22	3.41	3.34	52%
6. STEM university training develops skills that are essential across all blue career sectors.	4.17	3.42	3.52	3.64	3.69	64%
7. A marine or ocean-related STEM degree is a realistic and attractive option for my future.	4.08	2.69	2.88	3.40	3.28	45%
8. I am motivated to research STEM university programmes connected to the blue economy.	4.04	2.82	2.96	3.50	3.34	49%
9. Tackling ocean challenges requires scientific expertise, and I want to be part of that effort.	4.11	3.18	3.50	3.48	3.57	58%
10. I would encourage peers to consider STEM university pathways related to blue careers.	4.36	3.02	3.39	3.82	3.66	60%

Table 18. Ocean literacy

Question	Tahiti	Lipari	Sitia	Gozo	All	% agree
1. Earth has one big ocean with many features.	4.51	3.46	3.96	3.88	3.96	75%



Question	Tahiti	Lipari	Sitia	Gozo	All	% agree
2. The ocean and life in the ocean shape the features of the earth.	4.51	3.90	4.16	4.00	4.14	82%
3. The ocean has a major influence on weather.	4.32	n/a	4.12	3.93	4.12	82%
4. The ocean has a major influence on climate.	4.47	4.08	4.22	4.04	4.20	85%
5. The ocean makes Earth habitable.	4.43	4.02	4.24	4.05	4.19	84%
6. The ocean supports a great diversity of life.	4.51	4.02	4.46	4.16	4.29	86%
7. The ocean supports a great diversity of ecosystems.	4.42	4.16	4.43	4.02	4.25	86%
8. The ocean and humans are inextricably interconnected.	4.43	3.75	4.26	3.79	4.06	78%
9. The ocean is largely unexplored.	4.47	4.14	4.50	3.95	4.26	81%
10. Scientists believe the ocean produces between 50% and 80% of the Earth's oxygen.	4.36	3.78	3.84	3.69	3.92	70%

Note. The question on the influence of the ocean on weather was not included in the Italian form; its overall values refer to Tahiti, Sitia and Gozo.