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CodeBLUE

CONSOLIDATED OVERVIEW

OF

NATIONAL PATHWAY REPORTS

ON

INTEGRATING BLUE ECONOMY MODULES INTO VOCATIONAL TOURISM CURRICULA

CODE BLUE:

CROSS-DISCIPLINARY INNOVATIVE EDUCATION IN TOURISM AND SERVICES FOR A
SUSTAINABLE BLUE ECONOMY

Grant Agreement No 2025-1-BG01-KA220-HED-000363596



Barcelona School
of Tourism, Hospitality
and Gastronomy

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KEY WORDS AND DEFINITIONS



BlueComp

the European Union's competence framework that defines the knowledge, skills, and attitudes needed for sustainable development and innovation in the blue economy sectors



DigComp

the European framework that identifies the key digital competences citizens need for confident, critical, and safe use of digital technologies



Blue economy

all economic activities related to oceans, seas and coasts



ECTS

the European Credit Transfer and Accumulation System



Blue growth

the European Union's strategy for promoting sustainable economic growth and employment in marine and maritime sectors while protecting ocean and coastal ecosystems



EQF/ NQF

European Qualifications Framework



Blue skills

the knowledge, values, attitudes, competences and qualifications individuals need in order to participate in and support the sustainable development of the blue economy



ISCED-F

the International Standard Classification of Education — Fields of Education and Training (2013)



GreenComp

the European sustainability competence framework that supports individuals in developing knowledge, skills, and values for environmental sustainability and responsible action



Micro-credential

a small-volume, certifiable unit of learning outcomes that can be stacked, recognised and accumulated within and across qualifications



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Introduction

01

INTRODUCTION



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This consolidated overview has been prepared within **Work Package 2 “Mapping the Integration of the Blue Economy in Tourism Education”** of the Erasmus+ project **“Cross-Disciplinary Innovative Education in Tourism and Services for a Sustainable Blue Economy”** (CodeBLUE, Grant Agreement No 2025-1-BG01-KA220-HED-000363596). It synthesises the findings of five national pathway reports examining the integration of blue economy topics into vocational tourism curricula in Bulgaria, Croatia, Greece, Spain and Portugal, and presents the main findings and shared characteristics that emerge when these country-specific analyses are considered together. The purpose of the document is to serve as the common introductory section of project output **O2: A set of pathway reports detailing the integration of blue economy modules into vocational tourism curricula**, providing an integrated reading of the state of training related to the blue economy in the tourism sector and of the opportunities for embedding blue-economy modules into vocational, higher and lifelong tourism education across the partner countries.

Each national pathway report examines the alignment between the competence needs of coastal and maritime tourism within the blue economy and the educational provision currently available in the respective country. The reports combined desk research and curriculum analyses with surveys and stakeholder interviews, and were guided throughout by the European competence frameworks BlueComp (European Climate, Infrastructure and Environment Executive Agency [CINEA], European Commission, 2025), GreenComp (European Commission and Joint Research Centre, 2022) and DigComp 2.2 (European Commission, 2022). The comparative analysis confirms that, despite differences in geographical context, regulatory frameworks and educational systems, the partner countries share a remarkably consistent assessment: while tourism education provides a strong general foundation, the specialised competences required for the blue economy remain fragmented, insufficiently embedded within curricula and, in several key areas, largely underdeveloped.

The five national pathway reports are attached to this consolidated overview and providing the comprehensive findings summarised herein: Bulgaria - elaborated by the Varna University of Management); Croatia – elaborated by PAR University of Applied Sciences, Greece – elaborated by the University of Aegean; Spain – elaborated by CETT – Barcelona School of Tourism, Hospitality and Gastronomy); and Portugal – elaborated by KIPT Research Laboratory. Each chapter follows the shared methodological framework described in Section 3.



The overview is structured into nine sections, following the common research methodology developed and applied by the CodeBLUE partnership. Section 2 establishes the conceptual and policy context, positioning the analysis within the European blue economy and skills agenda. Section 3 outlines the shared methodological framework underpinning the national studies. Section 4 provides a comparative overview of the partner countries' education systems, legislative frameworks and qualification structures, including their alignment with the European Qualifications Framework and respective National Qualifications Frameworks in the project countries. Section 5 presents the consolidated CodeBLUE Skills Map, translating the identified competence frameworks into a coherent skills framework for the tourism sector. Section 6 synthesises the gap analysis by comparing existing and required competences and identifying common priority areas for education and training. Section 7 examines good practices from across the partner countries, highlighting transferable approaches and successful models. Section 8 presents the proposed learning pathways and micro-credential models for the flexible integration of blue economy competences into vocational tourism education. Finally, Section 9 summarises the principal cross-country findings, identifies the common characteristics emerging from the comparative analysis, and presents the overarching conclusions that frame the national chapters of the consolidated report.



02

CONCEPTUAL AND POLICY FRAMEWORK



2.1. The blue economy and tourism

The blue economy encompasses all economic activities related to oceans, seas and coasts, pursued under principles of sustainability, innovation and resilience (European Commission: Directorate-General for Maritime Affairs and Fisheries, 2025). Coastal and maritime tourism is its most visible and economically significant component, and it is a defining activity for each of the CodeBLUE partner countries. Bulgaria's Black Sea regions, Croatia's Adriatic coast, the Greek islands and mainland coastline, Spain's and Portugal's Mediterranean, Atlantic and archipelagic territories all depend on tourism as a principal driver of regional development, employment and territorial identity. This economic reliance is, however, increasingly coupled with structural pressures: seasonality, overtourism, coastal erosion, biodiversity loss, water stress, marine pollution and exposure to climate-related risks such as sea-level rise, marine heatwaves and extreme weather events.

These pressures reframe the sustainability of coastal tourism. It can no longer be understood solely in terms of growth, demand or service quality, but must be assessed in relation to environmental carrying capacity, marine ecosystem protection, climate adaptation, digital transition and the governance of shared coastal resources. In parallel, digitalisation is transforming destination management, visitor monitoring and service delivery. Together these dynamics generate an updated skills profile for tourism professionals that reaches well beyond conventional hospitality and management training and requires a genuine integration of environmental, technical, digital, business and social competences.

2.2. The European competence frameworks

The national pathway reports follow a shared analytical approach based on the integration of three complementary European competence frameworks. BlueComp, the competence framework to navigate the blue economy (CINEA, European Commission, 2025), provides the sector-specific architecture, structured around four competence areas: understanding the blue economy; digital and data skills; sustainability and resilience; and business innovation and governance. GreenComp (European Commission and Joint Research Centre, 2022) contributes cross-cutting sustainability competences such as systems thinking, futures literacy, political agency and responsibility towards nature. DigComp 2.2 (European Commission, 2022) supports the identification of digital competences relevant to information management, communication, digital content creation, safety and problem solving. Read together, the three frameworks allow tourism to be understood as embedded within marine systems, environmental thresholds, digital infrastructures and multi-actor governance arrangements.



The consortium's work is further situated within the broader European policy agenda for the blue economy and skills, including the EU Blue Economy Report 2025 (European Commission: Directorate-General for Maritime Affairs and Fisheries, 2025), the Study to Support and Design Skills Development in the Blue Economy and its associated Blue Economy Skills Survey (European Commission, 2025a), and emerging instruments such as the European Ocean Pact (European Commission, 2025b). Regional strategies, including the EU strategic approach to the Black Sea region and the Union for the Mediterranean's work towards a sustainable blue economy (Union for the Mediterranean, 2024), reinforce the same message: competence development, cross-sector training and digitalisation are preconditions for sustainable blue growth.

2.3. The quintuple-helix perspective

Across the partner countries, the research engaged five interconnected stakeholder groups — academia, business, the public sector, civil-society organisations and the natural environment advocates — following the quintuple-helix innovation model (Carayannis, Barth, & Campbell, 2012; Taratori et al., 2021). This perspective is central to the synthesis, as it highlights that integrating blue skills goes beyond curriculum development and represents a broader systemic transformation requiring coordinated engagement among education providers, industry actors, public authorities, communities and environmental agents. The stakeholder consultations conducted for each national report consistently confirmed that closer cooperation among these actors is a decisive condition for aligning education with the real needs of the coastal and maritime tourism industry.



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METHODOLOGICAL APPROACH ACROSS THE NATIONAL REPORTS



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The national reports were produced under a shared methodological framework designed to ensure comparability across Bulgaria, Croatia, Greece, Spain and Portugal. The approach is a mixed-methods design combining desk research, curriculum and course analysis, online surveys and semi-structured stakeholder interviews. Desk research reviewed policy documents, sector strategies, labour-market studies and existing academic and VET programmes, mapping current curricula against the competence needs of the blue economy.

The surveys collected insights from two key institutional lens: of the (i) education providers, comprising lecturers and learners from higher education, continuing VET and postgraduate tourism programmes; and of the (ii) education users, including employers and organisations — namely businesses, public authorities, civil society actors and environmental organisations — engaged in coastal and marine-related tourism activities.

The instruments were aligned with the BlueComp competence areas and with the survey structure of the European Blue Economy Skills Survey, which classifies competences into environmental and marine-science skills, technical and operational skills, digital skills, business and innovation skills, and social, cultural and communication skills. This alignment allowed each partner to generate directly comparable evidence on the perceived importance of the different skill groups and on their actual coverage in education and availability in the labour market. While the reports differ in emphasis — the Bulgarian and Spanish reports foreground legislative analysis and curriculum mapping, the Greek report offers particularly detailed survey and interview evidence, and the Croatian report concentrates on legally grounded integration pathways — the common framework makes their findings mutually reinforcing rather than merely juxtaposed.

The evidence base is substantial. In Bulgaria, 20 educational institutions, 20 study programmes and 20 courses across the North-Eastern and South-Eastern (Black Sea) regions were analysed, complemented by 75 survey responses and stakeholder interviews. In Greece, a desk mapping of 19 higher-education and vocational institutions across Athens, Piraeus, Corfu, Patras, Thessaloniki and Crete was combined with two online surveys gathering 63 responses (32 from academia and learners, 31 from employers and organisations) and 10 in-depth interviews spanning hospitality, environment, research, public administration, education and nautical sport. In Croatia, the curricula of 15 programmes distributed across EQF levels 4 to 7 and located mainly on the Adriatic coast were examined and mapped to the CodeBLUE skills. In Spain, a targeted desk review covered 15 programmes and initiatives across higher education, VET and continuing professional development in coastal and island regions. In Portugal, an educational mapping of higher-education tourism and maritime programmes was combined with two online surveys (32 responses from lecturers and students; 30 from employers and organisations), 10 semi-structured interviews with academia, research centres, governance bodies and industry.



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COMPARATIVE OVERVIEW OF NATIONAL EDUCATION SYSTEMS AND LEGISLATION



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A central purpose of the consolidated report is to reflect the specifics of legislation and educational systems in each partner country. Although the national systems differ in their governance and terminology, all are anchored in the European Higher Education Area, the Bologna and Copenhagen processes, the ECTS system and the reference levels of the European Qualifications Framework. Vocational tourism education is concentrated at EQF levels 4 and 5, higher tourism education at EQF levels 6 and 7, and lifelong learning cuts across these levels. This shared architecture is what makes a modular, micro-credential-based integration strategy feasible in every partner country. The subsections below summarise each national system before drawing out the shared characteristics.

4.1. Bulgaria

The Bulgarian system operates under the Higher Education Act (1995), the Vocational Education and Training Act (1999), the Pre-school and School Education Act (2016) and the National Qualifications Framework (2012), harmonised with EU qualification and lifelong-learning instruments. Higher education is organised into Professional Bachelor, Bachelor, Master and Doctor degrees, mapped to EQF levels 6, 7 and 8 respectively, with full ECTS implementation. Vocational education — delivered through vocational high schools, colleges and training centres — mainly covers EQF levels 3 to 5 and is aligned with the List of Professions for VET. Micro-credentials are not yet fully regulated as a distinct qualification type, but existing provisions for modular training, validation of learning outcomes (Ministry of Education and Science, 2014) and ECTS-based accumulation create a workable basis for their introduction. The analysis of 20 institutions across the Black Sea regions confirmed good coverage of general management, business, communication and some digital competences, but only a limited presence of specialised blue-economy skills.

4.2. Croatia

Croatia offers several legally grounded pathways for integrating new content across EQF levels 4 to 7. The Croatian Qualifications Framework (Act on the Croatian Qualifications Framework, 2018) links national qualifications to the EQF through learning outcomes, qualification standards and occupational standards. The Vocational Education Act (2022) regulates secondary VET at EQF level 4 and grants schools autonomy to shape school-level curriculum content in cooperation with employers, while the Adult Education Act (2021) underpins non-formal and shorter upskilling provision at EQF levels 4 to 5. At higher-education levels, integration is governed less by a single curriculum law than by the quality-assurance and programme-approval framework overseen by the Agency for Science and Higher Education (AZVO, 2015). The Croatian report emphasises that, for an Erasmus+ output, the most viable route is not the creation of a new qualification but the embedding of material into existing structures through school-level enrichment, electives, revised course units and short intensive modules.



4.3. Greece

Greece regulates secondary, higher and vocational education through a national framework aligned with EU qualification and lifelong-learning instruments, anchored in a series of recent laws — notably Laws 4653/2020 and 4763/2020, governing higher-education quality assurance and the national system of vocational education, training and lifelong learning respectively; Law 4957/2022 on higher education institutions; and Laws 5082/2024 and 5094/2024 strengthening vocational education and the public university (Hellenic Republic, 2020, 2020, 2022, 2024, 2024). Higher education follows the Bologna Process, offering Vocational Diplomas and Bachelor (EQF 6), Master (EQF 7) and Doctoral (EQF 8) degrees with full ECTS implementation, while vocational education spans EQF levels 3 to 5 through vocational schools, colleges and training centres. Micro-credentials and short-term learning are emerging but not yet fully recognised, with modular training and competence validation supported in VET and short modules integrated through ECTS in higher education. The national report analysing 19 education institutions — 11 university structures, two Higher Schools of Tourism Education and six post-secondary Higher Vocational Training Schools, finding that programmes cover general management, business, communication and some digital skills well but lack the specific blue-economy competences related to marine spatial planning, coastal ecosystems, GIS, climate risk and sustainable marine-resource management. Both learners and employers expressed strong demand for short, flexible, blended courses and micro-credentials.

4.4. Spain

Spain combines national legislative regulation with decentralised implementation by the Autonomous Communities, which is particularly relevant for coastal and island regions with distinct labour-market and environmental conditions. Secondary education is governed by the LOMLOE (Organic Law 3/2020 amending Organic Law 2/2006); vocational training by Organic Law 3/2022 on the Organisation and Integration of Vocational Training, which establishes a modular, competence-based and stackable system explicitly favourable to micro-credentials; and higher education by Organic Law 2/2023 on the University System (LOSU), which reinforces the role of universities in lifelong learning and short-cycle provision. Qualifications are aligned through the MECU and MECES frameworks. The Spanish report concludes that the principal challenge is not legal feasibility but curricular implementation: the legislative framework already supports modularity and flexibility, so the transition depends on pedagogical adaptation, interdisciplinary cooperation and institutional willingness.



4.5. Portugal

Portugal combines an extensive Atlantic coastline and a strong maritime identity with an unusually explicit strategic-policy foundation for the blue economy. National frameworks — the National Ocean Strategy 2021–2030 (Republic of Portugal, Ministry of the Sea, 2021), the Tourism Strategy 2027 (Turismo de Portugal, 2017) and the Circular Economy Action Plan 2023–2027 (Portuguese Environment Agency & Directorate-General for Economic Activities, 2023) — foreground sustainable blue growth, ocean literacy, innovation, digital transformation, human-capital qualification and ecosystem-based governance, and are strongly aligned with the EU Blue Economy agenda and the European Green Deal. The education and training system is referenced to the EQF, operates the ECTS system and is progressively adopting micro-credential and short-cycle provision through higher education, polytechnic and VET institutions.

The scale of tourism education is considerable: according to national statistics (Direção-Geral de Estatísticas da Educação e Ciência [DGEEC], 2025), Portugal had 456,032 students enrolled in higher education in 2024/2025, of whom around 5% study in the services field and roughly half of those in tourism-related programmes, three quarters at Bachelor and one tenth at Master level. Yet the educational mapping conducted for the national report found that only 28% of the analysed programmes include blue-skills-related courses or competences, while 72% show no explicit integration of blue-economy content. Blue competences are most developed where tourism education is combined with maritime, environmental or coastal specialisations — for example at the Politécnico de Leiria School of Tourism and Maritime Technology, the Politécnico de Coimbra, the University of Aveiro and the University of Algarve. The Portuguese diagnosis is therefore consistent with the other partner countries: a strong strategic and institutional foundation coexists with uneven, fragmented and largely programme-dependent curricular integration, with environmental and marine-science competences identified as both the highest priority and the most significant gap.

4.6. Shared characteristics of the education systems

Read comparatively, the national systems display four shared characteristics. First, all are anchored in the same European architecture — the EQF, ECTS and the Bologna and Copenhagen processes — which provides common reference points for credit, level and learning-outcome recognition. Second, tourism VET is consistently positioned at EQF levels 4 to 5 and higher tourism education at EQF levels 6 to 7, giving the consortium a stable band within which to design stackable modules.



Third, every system provides at least a partial legal basis for modular learning and the validation of learning outcomes, even where micro-credentials are not yet formally codified as a separate qualification type. Fourth, the decisive constraint is pedagogical and organisational rather than legal: in each country the flexibility to integrate blue skills already exists in principle, and the task is to translate that flexibility into coherent, competence-based provision. The table below summarises the comparison:

Country	Key legislation / framework	Qualifications structure	Tourism EQF focus	Micro-credential status
Bulgaria	Higher Education Act (1995); VET Act (1999); NQF (2012)	Professional Bachelor, Bachelor, Master, Doctor; ECTS	VET 3–5; HE 6–7	Not yet a separate type; modular training and validation enabled
Croatia	Croatian Qualifications Framework Act (2018); VET Act (2022); Adult Education Act (2021)	CROQF/HKO learning-outcome and occupational standards; ECTS	VET 4–5; HE 6–7	Enabled via school-level curriculum, adult education and electives
Greece	Laws 4653/2020 & 4763/2020; Law 4957/2022; Laws 5082/2024 & 5094/2024	Vocational Diploma, Bachelor, Master, Doctoral; ECTS	VET 4–5; HE 6–7	Supported; strong demand for micro-credentials and short courses
Spain	LOMLOE; Organic Law 3/2022 (VET); Organic Law 2/2023 (LOSU)	MECU/MECES; modular, stackable VET and HE; ECTS	VET 4–5; HE 6–7	Formally supported; VET micro-credentials already accredited
Portugal	National Ocean Strategy 2021–2030; Tourism Strategy 2027; Circular Economy Action Plan 2023–2027; EQF-referenced	HE (Bachelor/Master), polytechnic and VET provision; ECTS	VET 4–5; HE 6–7	Emerging; strong demand for micro-credentials and short courses

Table 1. Comparative overview of national education systems and qualification frameworks across the CodeBLUE partner countries

Source: own elaboration based on the national pathway reports



05 KEY SKILLS IDENTIFIED ACCORDING TO EUROPEAN FRAMEWORKS



To move from the abstract competence frameworks to an operational tool for tourism education, the consortium developed a consolidated CodeBLUE Skills Map. Drawing on BlueComp, GreenComp and DigComp, and informed by the Blue Economy Skills Survey and the national field research, the map identifies 24 key competences for the sustainable development of tourism as a blue-economy sector. These are organised into four principal skill categories — environmental and marine-science skills, technical and operational skills, digital skills, and business and innovation skills — with a fifth cross-cutting group of social, cultural and communication skills recurring throughout the national analyses, particularly in the Greek interviews and in the Portuguese national workshop, which stressed human-centred competences such as empathy, collaboration and relationship-building developed through experiential learning. Each competence is linked to a BlueComp competence cluster, an indicative ISCED-F field and a recommended EQF level, so that it can be mapped directly onto existing programmes and used as the basis for micro-credential design.

The map is significant for the synthesis in two respects. It provides a shared vocabulary that makes the national gap analyses directly comparable, and it demonstrates that blue-economy competences are inherently interdisciplinary: environmental knowledge, digital and data literacy, operational safety, business innovation and communication must be combined rather than taught in isolation. The full map is reproduced below:

Table 2: CodeBLUE Skills and Competence Map: Overviews of 24 Skills Surveyed in the Project Countries

Source: own elaboration based on the national pathway reports

No.	Competence / skill	Skills category	BlueComp [1]	ISCED-F	EQF
1	Understanding marine ecosystems and biodiversity	Environmental & marine-science	A / C	521	6
2	Sustainable management of marine and coastal resources	Environmental & marine-science	C	521	6
3	Climate risk assessment in coastal zones	Environmental & marine-science	C	532	6
4	Integrated Coastal Zone Management (ICZM) & Maritime Spatial Planning (MSP)	Environmental & marine-science	A / C	521	6
5	Basic knowledge of marine pollution	Environmental & marine-science	A / C	521	5

[1] BlueComp Competence Clusters - A: understanding the blue economy;
B: digital and data skills; C: sustainability and resilience;
D: business innovation and governance;
indicative ISCED-F fields and recommended EQF levels



No.	Competence / skill	Skills category	BlueComp [1]	ISCED-F	EQF
6	Environmental and tourism impact assessment	Environmental & marine-science	A / C	521	6
7	Fundamentals of maritime safety	Technical & operational	A / B	1041	4–5
8	Response to maritime incidents	Technical & operational	A / B	1041	5
9	Operational awareness of marine equipment	Technical & operational	A / B	715	5
10	Practical awareness of water-based tourism activities	Technical & operational	A	1014 / 1041	4–5
11	Awareness of marine infrastructure maintenance	Technical & operational	A / C	715	5
12	Operational risk management in maritime environments	Technical & operational	A / B	1041	5–6
13	Use of GIS for marine and coastal areas	Digital	A / B	612	6
14	Use of digital nautical and navigational charts	Digital	A / B	612	5–6
15	Use of marine forecasting applications	Digital	A / B	612	5
16	Collection and analysis of tourism and marine data	Digital	A / B	612	6
17	Digital communication with tourists	Digital	B	413	4–5
18	Management of online tourism platforms	Digital	B	413	5–6
19	Innovation in marine and coastal tourism	Business & innovation	D	1015	6
20	Sustainable development of new tourism products	Business & innovation	C / D	1015	6
21	Marketing and branding of sea destinations and products	Business & innovation	D	410	6
22	Management of marine and coastal tourist attractions	Business & innovation	D	410	6
23	Alternative forms of marine tourism	Business & innovation	D	1015	6
24	Collaboration with partners and stakeholders	Business & innovation	D	410	5–6



The national studies converged on a clear hierarchy of demand within this map. Business, management and communication competences — tourism product development, marketing, attraction management, stakeholder collaboration and digital communication with tourists — are widely valued and comparatively well provided. Environmental, digital and technical competences are rated as highly important by learners, academics and employers alike, yet are unevenly represented in curricula. Purely technical maritime skills, such as marine-equipment operation and infrastructure maintenance, tend to attract lower demand from tourism employers, who place greater emphasis on managerial, digital and sustainability-related competences. This pattern, consistent across the partner countries, directly informs a consolidated gap analysis.



06 CONSOLIDATED GAP ANALYSIS





The gap analysis is the analytical core of each national report and of this synthesis. It compares the competences required for sustainable coastal and maritime tourism with those currently reflected in education and training provision. Although conducted independently in each country, the analyses produce a remarkably convergent picture, which can be organised into three tiers of representation. The Portuguese educational mapping quantified this pattern with particular clarity: only 28% of the analysed tourism programmes incorporate blue-skills content, and environmental and marine-science competences were identified as the single most significant gap by both employers and experts (identified by eight of ten interviewees) — a finding that mirrors, in numbers, the qualitative diagnosis reached in the other partner countries.

6.1. Skills relatively well represented

Across all five completed reports, the current provision is comparatively strong in general tourism and service-sector competences. These include tourism product development and management, destination planning and operations, tourism marketing and branding, customer service and communication, project management, entrepreneurship and service innovation, digital communication with tourists, and stakeholder engagement. These competences are concentrated in tourism, hospitality and business-administration programmes (ISCED-F fields 1013, 1015 and 0410/0413) and confirm that none of the partner countries is starting from zero: the systems already provide an institutional and pedagogical foundation for further integration.

6.2. Skills partially represented

A second tier of competences appears only partially, inconsistently or in specialised niches. These include sustainable destination management, circular-economy approaches, smart-destination logic, applied environmental awareness, the use of data and digital tools, GIS and spatial-data applications, risk management, and isolated content on coastal planning or sustainable mobility. Characteristically, these competences surface in electives, specialised seminars, individual qualification or lifelong-learning courses, or regionally specific initiatives, rather than as consistent features of the core tourism curriculum. The Spanish report captures the shared diagnosis precisely: the problem is not merely the scarcity of relevant topics but the lack of curricular coherence and competence-based framing.



6.3. Skills weakly represented or largely absent

The most substantial and consistent gaps concern the competences that most distinguish blue-economy tourism from conventional tourism. Across the partner countries these include ocean and marine-ecosystem literacy for tourism professionals; ecosystem-based and integrated coastal zone management; maritime spatial planning; climate adaptation and resilience in coastal destinations; sustainable management of marine and coastal resources; tourism-specific environmental impact assessment; GIS and geospatial tools for destination planning; the systematic use of environmental and tourism data; marine safety and operational risk management; and the ethics of visitor management and wildlife interaction in fragile marine environments. These absences are especially significant because they correspond directly to the competences most needed for the long-term sustainability of the partner countries' coastal destinations.

6.4. Shared structural gaps

Beneath the specific skill gaps lie four structural weaknesses common to all partner countries. The first is the weak explicit integration of the blue-economy concept itself: learners encounter fragments of sustainability or marine content without the systemic framework that connects tourism to other maritime sectors, environmental policy and coastal governance. The second is insufficient interdisciplinarity: tourism education remains institutionally separated from marine science, environmental management, geography, planning and digital systems, which the reports identify as the single most important structural barrier. The third is the under-use of flexible modular formats and micro-credentials capable of rapid adaptation to sectoral change. The fourth is the persistent gap between theory and practice — most strongly articulated in the Greek interviews — where curricula remain too theoretical and disconnected from real operational data and field conditions.



Table 3. Consolidated three-tier gap analysis across the CodeBLUE partner countries

Source: own elaboration based on the national pathway reports

Representation level	Competences	Cross-country observation
Well represented	General tourism management; destination planning and operations; marketing and branding; customer service and communication; project management; entrepreneurship; digital communication with tourists; stakeholder engagement	A solid, shared foundation concentrated in tourism, hospitality and business programmes; provision is not starting from zero
Partially represented	Sustainable destination management; circular economy; smart destinations; applied environmental awareness; data and digital tools; GIS; risk management	Present in electives, seminars and regional initiatives rather than the core curriculum; lacks coherence and competence-based framing
Weak or absent	Ocean and marine-ecosystem literacy; ICZM and MSP; climate adaptation and resilience; sustainable marine-resource management; environmental impact assessment; geospatial tools; marine safety; visitor-management ethics	The competences that most distinguish blue-economy tourism; consistently the largest and most critical gaps in every partner country

6.5. Shared priority training areas

The gap analysis translates into a consistent set of priority training areas endorsed, in slightly different formulations, by every partner country. These are: blue-economy literacy for tourism professionals; ocean literacy and marine-ecosystem awareness; climate adaptation and resilience in coastal destinations; sustainable coastal planning and ecosystem-based approaches; GIS, spatial data and data-driven destination management; blue tourism product design and low-impact innovation; circular economy in tourism operations; maritime safety and operational awareness; and visitor management, ethics and stakeholder collaboration. The convergence of these priorities across five independent national studies is one of the most important findings of the synthesis, because it indicates that a single, shared modular framework can meaningfully serve all partner countries while remaining adaptable to local conditions. The Portuguese report adds two useful points of emphasis to this shared agenda: it places environmental and marine-science competences firmly at the head of the priority list, and — reinforced by its national validation workshop — it argues for the explicit cultivation of human-centred and interpersonal competences (empathy, collaboration, relationship-building) through experiential, problem-based and interdisciplinary learning rather than treating them as innate traits.



07

GOOD PRACTICES ACROSS THE PARTNER COUNTRIES





Each national report identified examples of good practice that demonstrate how blue-economy competences can be delivered in interdisciplinary, modular and practice-oriented formats. Taken together, these examples show that the partner countries do not suffer from a total lack of innovation but from a lack of systematic mainstreaming: the most relevant initiatives typically sit at the margins of mainstream tourism education, in postgraduate, specialisation, project-based or continuing-training formats, rather than in the core curriculum.

In Bulgaria, interdisciplinary bachelor programmes such as “Maritime Business and International Trade” (University of Economics – Varna), “Sustainable Development and Tourism” (Konstantin Preslavsky University of Shumen) and “Cruise Ship Management” (Nikola Vaptsarov Naval Academy) show how blue-economy context, sustainability, GIS and maritime operations can be embedded in economic, environmental and transport-oriented curricula, even where fully coastal-tourism-specific programmes are still absent. In Croatia, Interreg Italy–Croatia projects — MareSkill, InnovaMare and its InnovaMare Academy, and LEAP TO BLUE — demonstrate cross-border, industry-linked blue-skills training through academies, workshops and voucher-based support, alongside university provision at the University of Rijeka's Faculty of Tourism and Hospitality Management. In Greece, the final national report highlights interdisciplinary university programmes that already bridge maritime knowledge and tourism: the National and Kapodistrian University of Athens Department of Port and Maritime Management (with courses on blue growth and sustainability, coastal-zone and marine-environment management, oceanography, marine pollution and cruise and port services), the University of the Aegean Department of Tourism Economics and Management (combining sustainable development, environmental management and tourism planning, GIS and alternative forms of tourism), and the University of Patras Department of Tourism Administration (integrating spatial planning, sustainable tourism and GIS) — complemented by the strong readiness of hospitality operators, environmental organisations and research bodies to host pilot and experiential training.

Spain offers the most explicitly blue-labelled portfolio: the University of Cádiz Tourism–Marine Sciences double-degree track and Acuipesca master; the University of Barcelona Sustainable Blue Economy Chair; the Tenerife+Talento nautical-aquatic professional training programme, which has trained over 3,200 professionals in free, blended, stackable formats; the IES Virgen de la Candelaria EQF-5 specialisation in Sustainable Tourism and Smart Destinations, one of Spain's first VET-level blue micro-credentials; the EA Project blue and circular economy online course; and the CIFP Marítimo Zaporito dual-training aquaculture programmes. These examples illustrate the full range of delivery models — interdisciplinary degrees, academic chairs, VET micro-credentials, dual training and short professional courses — that CodeBLUE seeks to generalise.



In Portugal, blue-economy competences are most advanced where tourism education is combined with maritime, environmental or coastal specialisations. Notable examples include the University of Algarve's Joint Bachelor in Sustainable Blue Economy (SeaBluE), developed within the European University of the Seas alliance and explicitly addressing tourism as a blue industry; the Politécnico de Leiria School of Tourism and Maritime Technology, which links tourism and recreation with maritime activities and with safety, rescue and risk-management techniques; the University of Aveiro Master in Tourism Management and Planning, which integrates marine and coastal management, environmental policy and tourism digitalisation; and the Politécnico de Coimbra programmes in adventure tourism and nature sports and in tourism in rural and natural areas, which embed GIS, ecology, biodiversity and nature conservation. Portugal also demonstrated a distinctive process-level good practice: a national validation workshop that convened policymakers, researchers, educators and industry to test the findings and surface the importance of experiential, collaborative and human-centred learning. Table 4 summarises the transferable features across the consortium.

Country	Illustrative good practice	Format / EQF	Transferable feature
Bulgaria	Maritime Business & International Trade; Sustainable Development & Tourism; Cruise Ship Management	HE degrees, EQF 6	Embedding blue context, GIS and sustainability in adjacent disciplines
Croatia	MareSkill; InnovaMare Academy; LEAP TO BLUE (Interreg Italy-Croatia)	Academies, workshops, CPD	Cross-border, industry-linked, flexible training formats
Greece	Interdisciplinary university programmes: NKUA Port & Maritime Management; Univ. of the Aegean Tourism Economics & Management; Univ. of Patras Tourism Administration	HE degrees, EQF 6	Bridging maritime knowledge and tourism; GIS and sustainability embedded
Spain	UCA Tourism-Marine double degree; UB Blue Economy Chair; Tenerife+Talento; IES Virgen de la Candelaria; EA Project; CIPF Zaporito	HE, chair, VET micro-credential, CPD, dual VET	Explicit blue labelling; stackable, free, blended micro-credentials
Portugal	SeaBluE Joint Bachelor in Sustainable Blue Economy (Univ. Algarve); Politécnico de Leiria School of Tourism & Maritime Technology; Univ. Aveiro MSc; national validation workshop	HE degree, MSc, polytechnic, expert workshop	Tourism-maritime/environmental integration; stakeholder validation and experiential, human-centred learning

Table 4. Good practices and their transferable features across the CodeBLUE partner countries

Source: own elaboration based on the national pathway reports

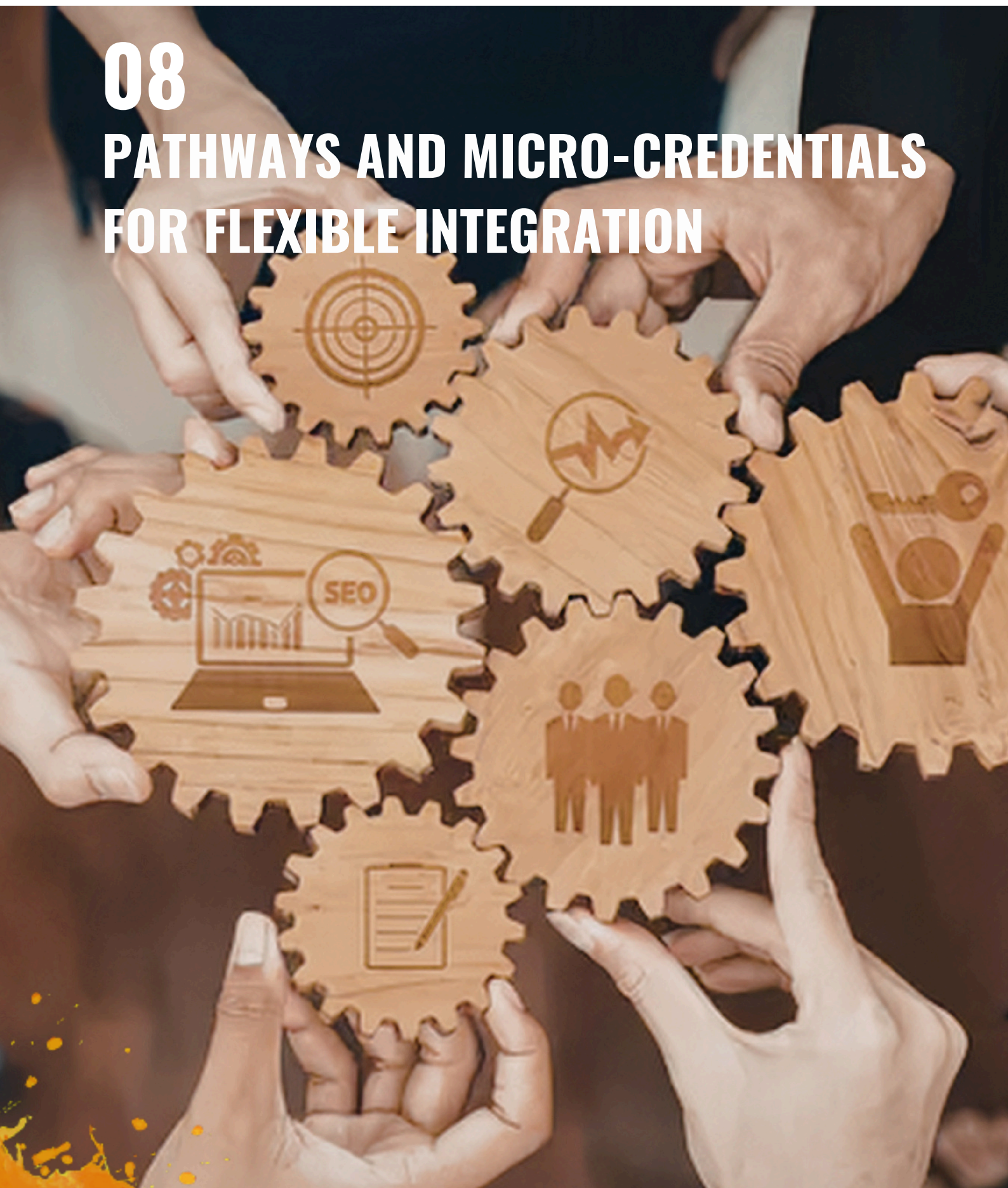


The transferable features are consistent: the strongest initiatives combine cross-border or cross-sector cooperation, address concrete skills gaps and employability needs rather than remaining purely theoretical, use flexible formats such as academies, workshops, micro-credentials and dual training, connect education with industry and innovation ecosystems, and remain adaptable across levels from professional training to higher education. These features constitute a practical template for the consortium's curriculum work.



08

PATHWAYS AND MICRO-CREDENTIALS FOR FLEXIBLE INTEGRATION





The national reports arrive at a shared strategic conclusion: the most appropriate response to the identified gaps is not the wholesale creation of new degree programmes but the flexible, progressive integration of blue-economy competences into existing academic and vocational provision through modular pathways and micro-credentials. This conclusion follows directly from the legislative analysis in Section 4, which showed that every partner system already supports modularity, learning-outcome validation and ECTS-based accumulation, and from the good-practice review in Section 7, which showed that stackable, practice-oriented formats are the most effective delivery mechanisms.

Two complementary integration models recur across the reports. The first enhances an existing course by inserting specialised micro-credentials that target specific gaps identified in the analysis — the approach illustrated by the Bulgarian model built on the “Tourism Destination Management” course at the University of Economics – Varna, in which an interdisciplinary module on “Sustainable Management of Coastal Tourism and the Blue Economy” is structured into micro-credentials of one ECTS and 30 learning hours. The second develops a new interdisciplinary course with a modular structure, in which each module functions as an independent micro-credential — illustrated by the Bulgarian “Hospitality Management in the Context of the Blue Economy” model of five one-ECTS modules at the Varna University of Management, and by the five-module structure proposed in the Spanish report (blue-economy literacy; coastal ecosystems, climate adaptation and resilience; digital tools for sustainable coastal tourism; blue tourism product design and innovation; and maritime safety, ethics and visitor management).

A standardised 30-hour unit, corresponding to one micro-credential and one ECTS, provides a common design template that can be adapted to full-time, part-time, distance and blended delivery by varying the proportion of contact and independent-study hours. Each unit specifies learning outcomes, teaching and assessment methods, ECTS workload and the BlueComp competences addressed. This standardisation is what allows a single modular framework to operate across the different EQF levels and institutional contexts of the partner countries. Croatia's report adds a useful catalogue of concrete integration options mapped to education levels, reproduced in adapted form in Table 5, which applies with minor variation to all partner systems.



Table 5. Options for integrating blue-economy modules into existing provision, by education level

Integration option	Best-fit level	Main implication
School-level curriculum enrichment	EQF 4 (VET schools)	Fastest route for adding thematic blue content within existing programmes
Inclusion in an existing vocational curriculum	EQF 4–5	Feasible where content matches current learning outcomes and sector needs
Adult education / lifelong-learning programme	EQF 4–5	Suitable for reskilling and upskilling active professionals
New elective or revised course unit	EQF 6–7 (HE)	Usually the most practical route for universities and polytechnics
Short specialised module / blended intensive	EQF 5–7	Flexible option for pilot implementation and internationalisation
Stackable micro-credential (1 ECTS / 30 h)	EQF 4–7	Common design template; accumulable towards larger qualifications

Source: own elaboration based on the national pathway reports

Table 6. Exemplary micro-credential design template for one illustrative competence unit (Marine Ecosystem Literacy, BlueComp: Environmental & Marine-Science Competences, EQF 5, 1 ECTS / 25~30 h)

Learning Outcomes	Content Overview	Teaching Method	Assessment Method	BlueComp Alignment
Identify key marine ecosystems and their economic importance for coastal tourism (EQF 5 descriptor:	Marine and coastal ecosystem types; ecosystem services supporting coastal tourism; human	Case study analysis; field excursion (virtual or on-site); problem-based learning scenario	Portfolio entry documenting one local ecosystem; short written reflection (400–600 words)	BlueComp Area 1: Environmental & Marine-Science Competences – 1.1 Marine Ecosystem Literacy
Apply basic sustainability assessment criteria to a blue-economy tourism product or activity	Sustainability frameworks (SDG 14, MSP, ICM); blue economy indicators; responsible	Guided project: sustainability audit of a selected coastal tourism product; peer discussion	Oral presentation of sustainability audit findings; tutor-assessed rubric against EQF 5 criteria	BlueComp Area 1: 1.2 Ecosystem-Based Management & Integrated Coastal Management

Source: Own elaboration. The template is illustrative; partner institutions should adapt learning outcomes, content and assessment to their EQF level and programme context.

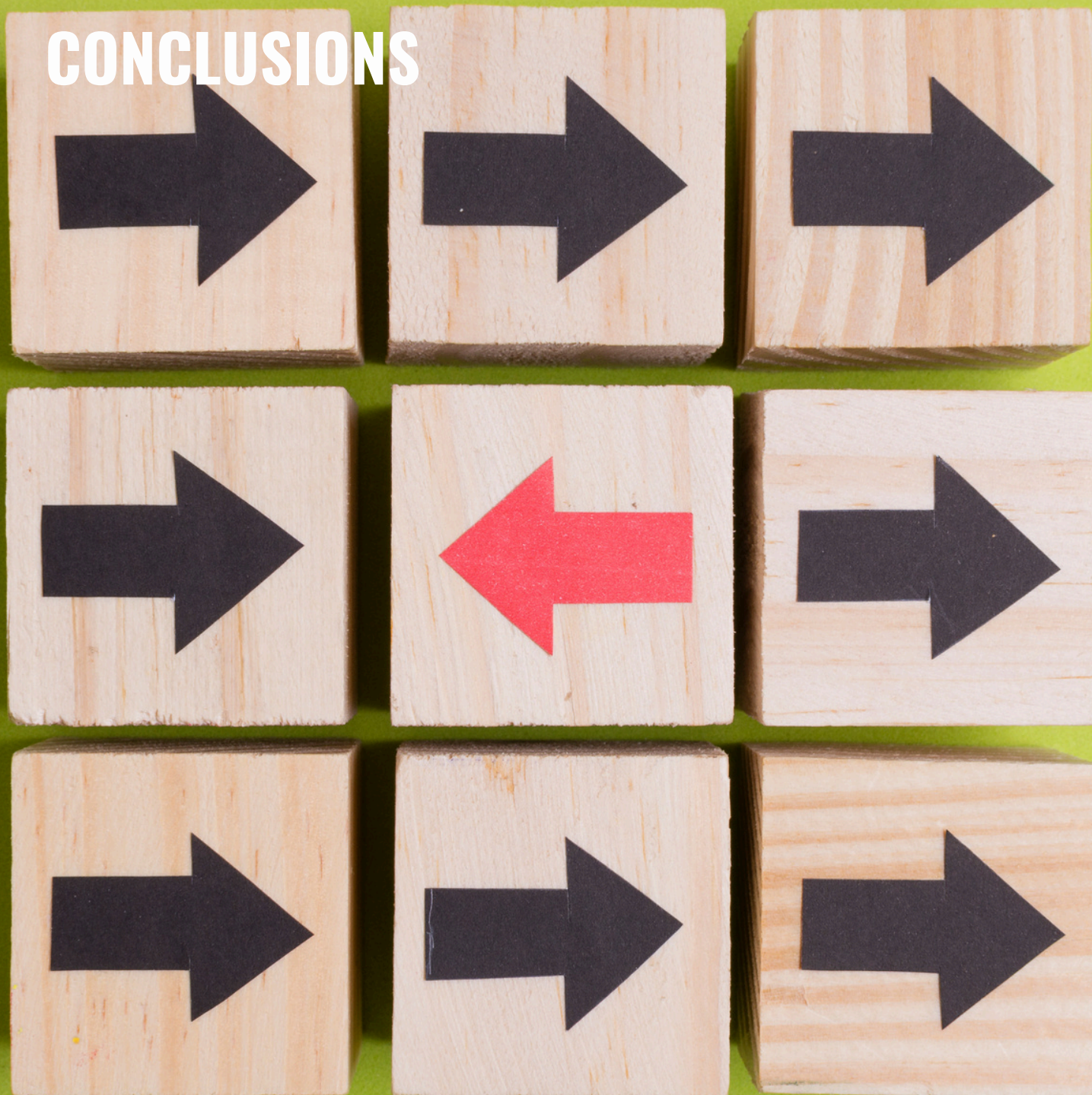


The pathway approach carries three shared advantages emphasised by every partner. It enables gradual integration without full programme restructuring or re-accreditation, allowing institutions to adapt quickly to sectoral change. It is compatible with the Erasmus+ implementation logic of piloting, stakeholder validation and gradual institutional uptake. And it supports lifelong learning by allowing professionals already active in the sector to upgrade specific competences through short, targeted units. Realising these advantages depends, in turn, on stronger involvement of industry, public institutions and local stakeholders in curriculum design — a recommendation common to all national reports and consistent with the quintuple-helix perspective.



09

SHARED CHARACTERISTICS AND CONCLUSIONS





Reading the national pathway reports together yields a coherent and mutually reinforcing account of the state of training for the blue economy in the tourism sector across the CodeBLUE partner countries. Six shared characteristics stand out.

1

coastal and maritime tourism is economically central to every partner country and is simultaneously exposed to intensifying environmental, climate and digital pressures that redefine the competences its workforce requires.

2

the education systems, though institutionally distinct, share a common European architecture of EQF levels, ECTS and learning-outcome-based qualifications, and each provides at least a partial legal basis for modular and validated learning.

3

current tourism education offers a solid foundation in general management, business, communication and basic digital competences, but only a fragmented and inconsistent treatment of the specialised competences that define blue-economy tourism.

4

the most critical and consistent gaps concern marine and ocean literacy, ecosystem-based and integrated coastal management, climate adaptation and resilience, specialised digital and geospatial tools, marine safety, and the ethics of visitor management — together with the four structural weaknesses of weak blue-economy framing, insufficient interdisciplinarity, under-use of modular formats, and a persistent theory-practice divide.

5

learners, academics and employers across the partner countries express strong and convergent demand for practical, short, flexible and blended learning, delivered through micro-credentials that carry recognised credit and connect to real operational conditions.

6

the preferred response in every country is the same: not new degree structures, but the progressive integration of blue skills into existing provision through interdisciplinary, modular and stackable pathways, designed with active stakeholder involvement.

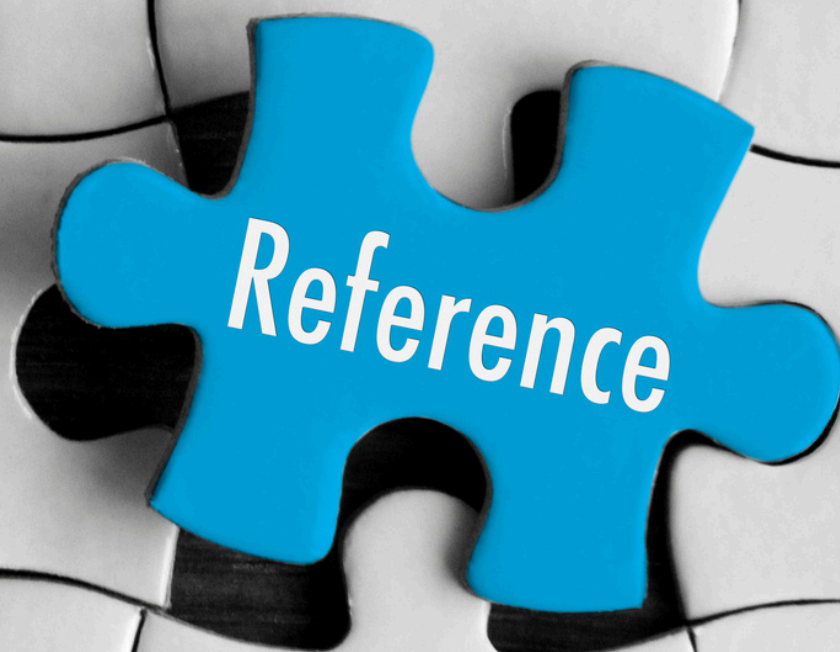


These shared characteristics provide the analytical foundation for the country-specific chapters that follow in the consolidated report and for the modular curriculum to be developed under Work Package 3. The convergence of independent national findings is itself the central conclusion of this introduction: it demonstrates that a common CodeBLUE framework — built on the shared Skills Map, the three-tier gap analysis, the agreed priority training areas and a standardised micro-credential template — can serve all partner countries coherently while remaining adaptable to their distinct legislative, institutional and territorial realities. In this sense, the partner countries face not five separate challenges but a single, shared opportunity: to align tourism education with the needs of a sustainable blue economy, and to prepare a workforce capable of supporting more resilient, responsible and innovative forms of coastal and maritime tourism. The now-complete five-country evidence base consolidates rather than qualifies this diagnosis. The Portuguese assessment, validated through a national expert workshop, confirms the shared picture while enriching it in two respects: it establishes environmental and marine-science competences as the foremost priority for blue-economy tourism education, and it foregrounds human-centred, experiential and interpersonal learning as an explicit — and teachable — dimension of the future curriculum, alongside the environmental, digital and business competences common to all partner countries.

The priority training areas identified in this overview — marine and ocean literacy, integrated coastal management, climate adaptation and resilience, and specialised digital and geospatial competences — directly inform the modular curriculum to be developed under Work Package 3 (WP3) of the CodeBLUE project. Specifically, the gap analysis findings will shape the selection and sequencing of WP3 learning modules, with the highest-priority competence gaps (common to four or more partner countries) forming the core of the shared curriculum framework, and country-specific gaps addressed through optional contextualisation modules. The micro-credential template proposed in Section 8 provides the design unit that WP3 will use to translate these priorities into accumulable, transferable learning units.



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