Blue Bio Techpreneurs

DELIVERABLE 2.4

FINAL REPORT ON MOOC IMPLEMENTATION, LESSONS LEARNED AND RECOMMENDATION

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ABBREVIATIONS

ABBREVIATION	DESCRIPTION
BBT	Blue Bio Techpreneurs
BBA	BLUEBIO ALLIANCE
D	Deliverable
DANIDA	Danish International Development Agency
EC	European Commission
EIT	European Institute of Innovation and Technology
EPICUR	European Partnership for an Innovative Campus Unifying Regions
EU ENTRECOMP	European Entrepreneurship Competence Framework
EU DIGCOMP	European Digital Competence Framework for Citizens
EU GREENCOMP	European Sustainability Competence Framework for Citizens
M	Month
MOOC	Massive Open Online Course
MPA	Marine Protected Area
MSP	Maritime Spatial Planning
PMBA	Pole Mer Bretagne Atlantique
PO	Project Officer
PP	Project Partner
RAS	Recirculating Aquaculture System
SDU	University of Southern Denmark
SUB	SUBMARINER Network for Blue Growth EEIG
UG	University of Gdańsk
WP	Work Package

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1. INTRODUCTION

This deliverable covers the implementation phase and assesses how the MOOC was translated into five free and open online courses. It reviews the published course portfolio, early impact, and the key lessons learned. Building on Deliverable 2.3, which presented the pedagogical design, course structure, methodology, and publication plan, it focuses on how the MOOC was realised in practice, including the published course portfolio, platform integration, early impact, and lessons learned.

The MOOC was developed as a capacity-building initiative to help address skills gaps in the blue bioeconomy, with particular emphasis on entrepreneurship, innovation, sustainability, and transversal competences with a specific focus on the blue biotechnology sector. The five-course programme draws on the European competence frameworks EntreComp1, GreenComp2, and DigComp3, while integrating sector-specific knowledge related to the blue economy and blue biotechnology.

The report concludes by identifying recommendations, exploitation, and replication, and considers how this experience can support the development of durable, accessible, and high-quality educational outputs in future European projects.

2. OBJECTIVES AND OUTCOMES – OVERVIEW

The original ambition for the Blue Bio Techpreneurs MOOC was a five-course portfolio, built on European competence frameworks, designed to reach around 2,000 learners and to foster genuine peer-to-peer social learning alongside individual skills development. This section summarises how far that ambition has been met, before we dive into more detail.

- **Course delivery —** All five courses were designed, implemented, and published as intended, each able to stand alone while also forming part of a coherent portfolio that allows learners to enter the MOOC at the course most relevant to them.
- **Reach —** The MOOC has performed well beyond expectations. Against an original target of 2,000 learners, the portfolio has reached 3,755 total enrolments as of August 2026, with every course continuing to attract new learners well past its initial launch period. At the current trajectory, the portfolio is realistically on track to reach 4,000–5,000 learners by the end of 2026.
- **Geographic reach —** Within Europe, the United Kingdom is the leading source country across all courses, followed by Italy, with Germany, Spain, and Portugal usually making up the rest of the top five (see Annex for the full country-by-course breakdown). However, the courses have also appealed to a global audience, with learners from the US, Africa, Asia, South America and Australia.
- **Social learning —** Learners engaged extensively and thoughtfully with the course content and with the facilitators, leaving a combined 2,754 comments across the five courses, a substantial body of reflection, questions, and shared professional experience. What grew less strongly was direct learner-to-learner dialogue.
- **Career and labour-market relevance —** Learners' comments and shared certificates on LinkedIn suggest the MOOC is supporting its intended role in bridging skills development and labour-market needs.

[1] https://joint-research-centre.ec.europa.eu/entrecomp-entrepreneurship-competence-framework_en
[2] https://joint-research-centre.ec.europa.eu/greencomp-european-sustainability-competence-framework_en
[3] https://joint-research-centre.ec.europa.eu/projects-and-activities/education-and-training/digital-transformation-education/digital-competence-framework-digcomp_en

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- **Legacy —** The MOOC's aim of outlasting the project's formal lifetime is well placed to succeed. Two factors support this. First, the courses will remain live on FutureLearn, a professional online learning platform, for a further year beyond the project's formal end, so the portfolio will continue to attract learners and generate impact well past the reporting period. Second, all course content exists independently of the platform and remains fully owned by the consortium, so it is not tied to the current hosting arrangement.

3. FROM DESIGN TO IMPLEMENTATION

3.1 Design

The Blue Bio Techpreneurs MOOC was developed not as a single static repository of content, but as a learner-oriented course portfolio designed for publication on FutureLearn. As described in Deliverable 2.3, its design was based on a competence-driven, pedagogically structured approach intended to address skills gaps in the blue bioeconomy, particularly in entrepreneurship, sustainability, digital readiness, and transversal competences. The overall concept combined the European competence frameworks EntreComp, GreenComp, and DigComp with sector-specific knowledge related to the blue economy and blue biotechnology.

From the outset, the MOOC was designed as a five-course programme in which each course addressed a specific focus area (1: Blue Bioeconomy Entrepreneurship, 2: Land-based Approaches, 3: Coastal Approaches, 4: Maritime Spatial Planning & Marine Restoration, 5: Blue Biotechnology) while also functioning as a standalone learning opportunity. This gave learners a high degree of flexibility, allowing them either to begin with the introductory course on blue bioeconomy entrepreneurship or to engage directly with a topic relevant to their needs and interests. In this way, the portfolio was intended to be accessible and meaningful for a diverse target group, ranging from students and aspiring entrepreneurs to researchers and industry professionals. The diverse topics needed to be included to create a general understanding and to show the interlinkages between the sectors.

3.2 Course architecture

The course architecture, described in more detail in the next section, followed a clear hierarchical structure: modules/weeks were organised into sections, which were, in turn, broken down into specific activities/subsections. These activities included articles, videos, interviews, quizzes, exercises, comprehension questions, discussions, and additional reading materials. Their selection was not arbitrary but aligned with state-of-the-art pedagogical logic and specific activity formats, and more general ones like the commenting function, ensuring the learning experience would be both engaging and suitable for online delivery. Throughout the MOOC development, FutureLearn provided support and quality control, based on their established pedagogical expertise and experience in designing successful online learning experiences, which in turn further increased the MOOC's quality standards.

An important design feature was the collaborative development process behind the content. The MOOC was co-created by consortium members and external experts representing academia, industry, and blue economy support networks, and was further enriched through input from contributing initiatives and European projects. This approach helped ensure that the courses reflected both

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educational quality and practical relevance, while drawing on a broad range of expertise across the blue bioeconomy field.

To support coherence across the portfolio, the design phase also established a common methodology for course development. As a result, the MOOC was designed not only as a set of individual educational resources but also as a coherent, professionally structured learning offer tailored to the needs of diverse users and the requirements of a professional MOOC platform.

3.3 Implementation

As presented on the Deliverable 2.3 we had organised the MOOC around courses, modules, sections, and activities, and that pedagogical design remained the backbone of the portfolio. For publication, the consortium then mapped it onto FutureLearn's course architecture, which is organised into weeks, activities, and steps (Figure 1).

Within FutureLearn, **weeks** are the main structural units of a course. They help organise the learning journey and indicate the expected study rhythm for learners, even when the course is delivered in an on-demand format, and learners can progress at their own pace. Each week, therefore, needed to have a clear focus, a manageable workload, and a logical progression from the previous week.

Each week is further divided into **activities**. Activities group together a set of connected learning elements around a central theme, topic, or learning outcome. This structure is important because it breaks the course into manageable parts and helps learners navigate the course more easily through the platform's "to-do" list. Instead of encountering a long list of individual learning items, learners move through coherent activity blocks that support the course's overall narrative.

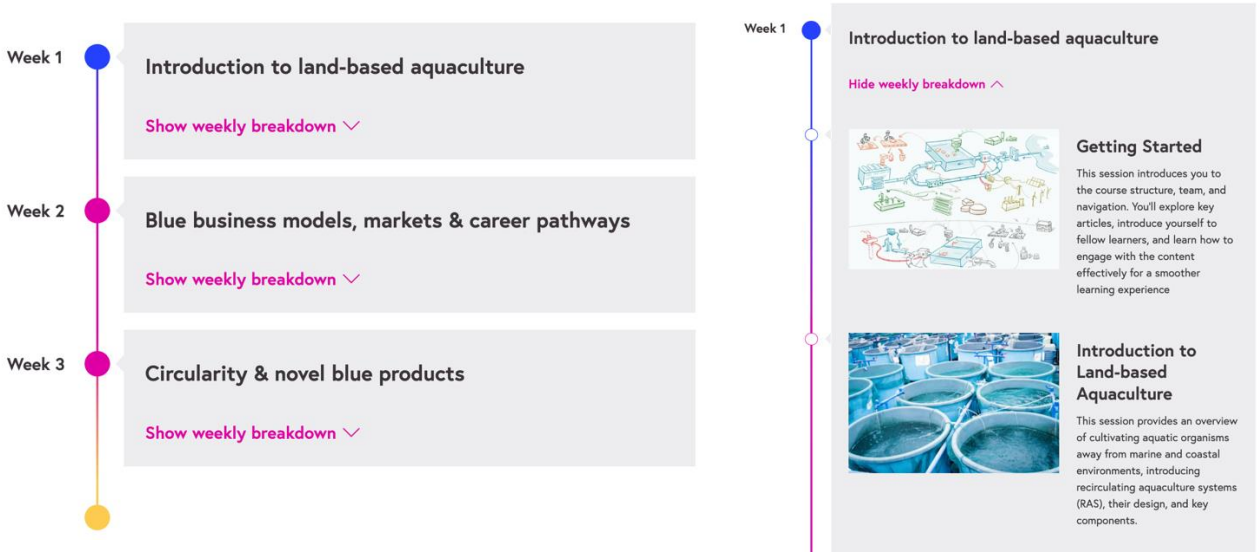

FIGURE 1. WEEKS AND ACTIVITY STRUCTURE

The smallest unit of learning on FutureLearn is the **Step** (Figure 2). Steps appear as individual pages within a course and can take different forms, including articles, videos, audio, discussions, exercises, polls, assignments, assignment reviews, quizzes, and tests. Each step is expected to be meaningful and to contribute to learner progress. In this sense, implementation was not a matter of uploading existing materials to the platform. The consortium had to transform the available content into a sequence of connected learning steps, with diverse step development and content integration that supported

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reflection, engagement, knowledge acquisition, and applied understanding. The steps mentioned earlier, called tests, are placed at the end of each week and comprise questions about that week's topic. Each test prompts the learner to recall the main points of each week, and learners who achieve an overall score of at least 80% across all of a course's weekly tests receive a course certificate.

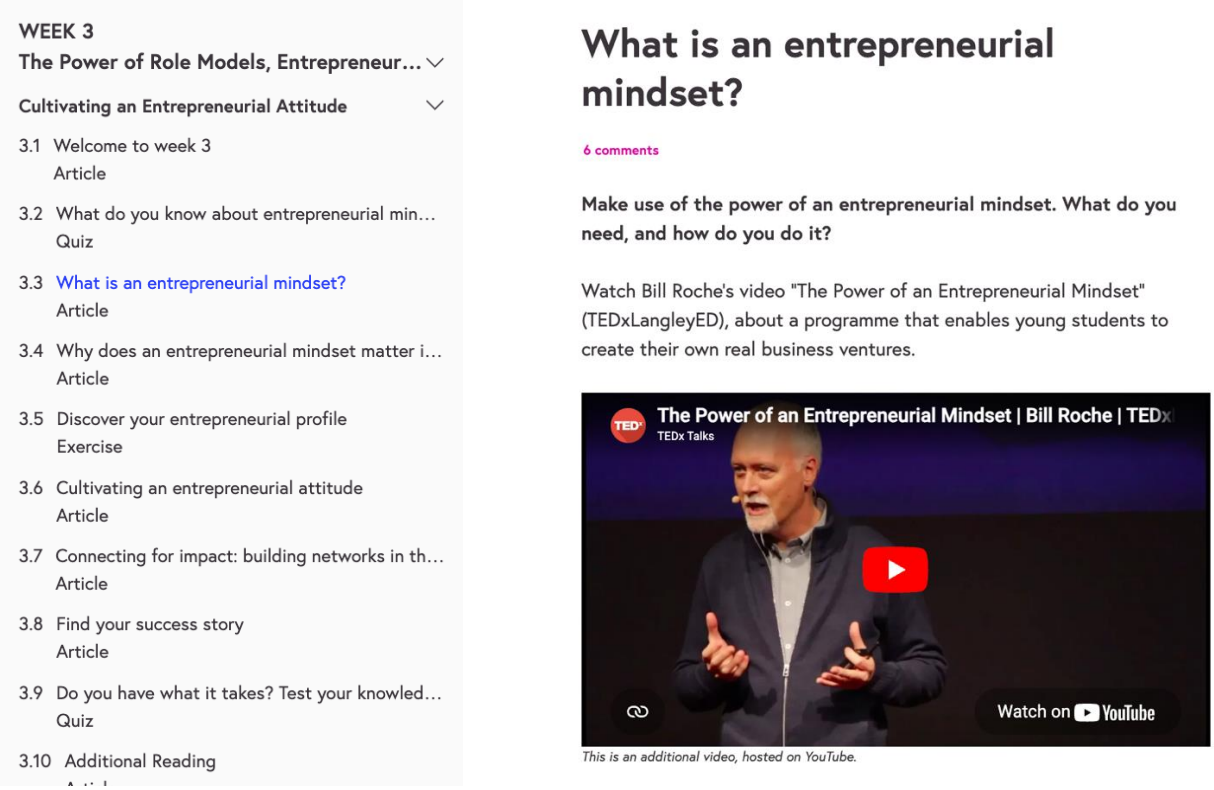

FIGURE 2. STEPS STRUCTURE

Article steps were used to present core concepts, explanations, case studies, and further reading. **Video** steps were used to bring in expert voices, interviews, and more dynamic forms of learning. **Discussion** steps and social prompts supported peer-to-peer exchange, reflection, and community building. **Quizzes**, tests, polls, and exercises were used to reinforce understanding, encourage active participation, and provide opportunities for learners to check their progress. Since discussion and comments can be integrated into many step types, the course design also allowed learners to reflect and interact with other learners throughout the learning journey, rather than only at isolated discussion points.

Before adding the course content to the platform, each course also required preparing a course overview, a course application, and a planned launch date (Figure 3). This was an important preparatory step, as it required defining the course title, introduction, course overview, syllabus, target audience, learning focus, expected learning time and outcomes, and other learner-facing information. Preparing this overview helped ensure that each course was aligned with the project's objectives and translated the course aims into clear, attractive information for potential learners. It also supported articulating expected outcomes and ensured that the published course description accurately reflected the course's content and purpose.

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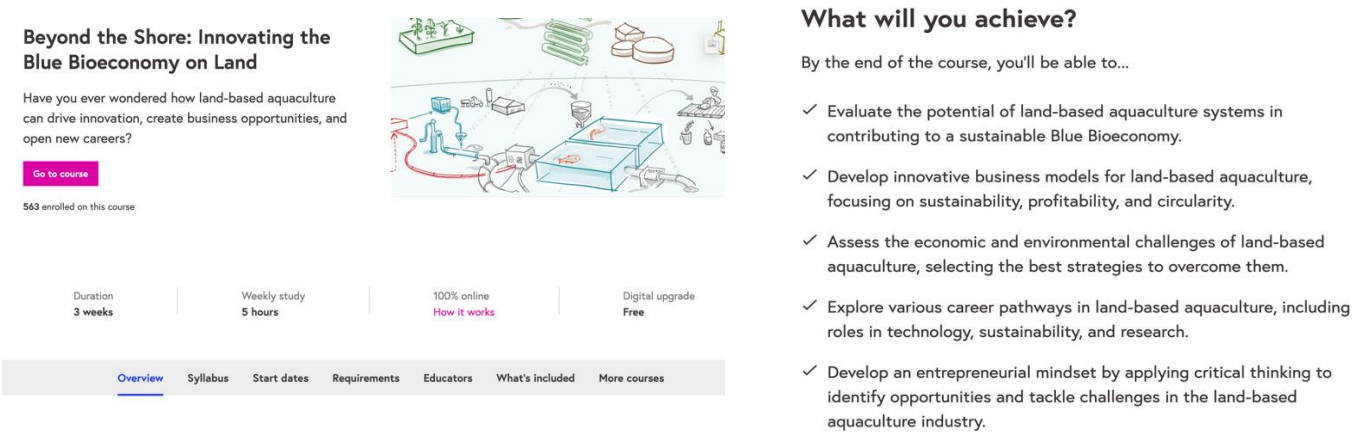

FIGURE 3. COURSE OVERVIEW

3.4 Certification

Certificates were designed for learners completing the courses (Figure 4). These certificates provided formal recognition of course completion and also reflected the partners and project context behind the course's development. The certificates were signed by the managing director of SUBMARINER Network.

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FIGURE 4. CERTIFICATE (LEARNER NAME REDACTED)

3.5 Course contributors

Course contributors were invited to provide content on the basis of their expertise, and each was set up with an educator profile on the platform (Figure 5). This was important both for internal access to the course content and for the public presentation of educators on the course overview page.

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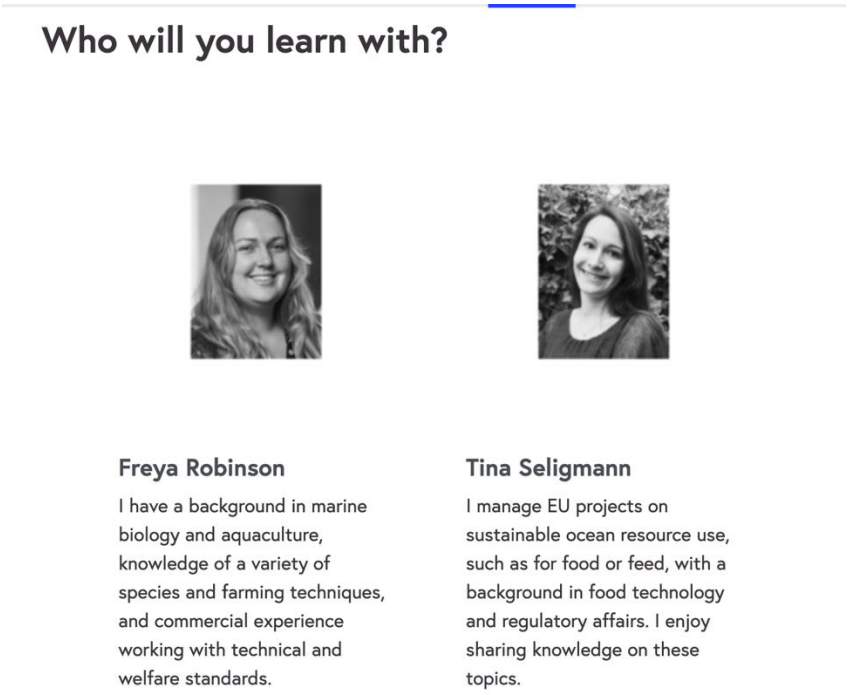

FIGURE 5. EDUCATORS EXAMPLE

3.6 Quality assurance and continuous improvement

The first course played an important role in this process, as it allowed the consortium to become familiar with the platform's structure, workflow, and quality expectations. During this initial phase, the team carried out several rounds of revision to better understand which step formats and course structures best supported the pedagogical aims of the MOOC. This involved not only technical familiarisation with the platform, but also reflection on how the content could be presented in the most accessible and engaging way for learners.

The review process for the first course involved the wider team and helped ensure that both the content and the structure were relevant, coherent, and aligned with the learning objectives. The platform requires submission of the **Quality Assurance Criteria** before submitting/publishing the course. These criteria helped the consortium follow and understand the essential course requirements and the elements that strengthen a course's overall quality. They provided a practical reference point for checking whether the course met the platform's expectations before publication.

As experience increased, the implementation process became more efficient from course 1 onwards. For example, a more structured implementation process was gradually established to support the management of the large number of materials included in each course. This was implemented through template design, continuous template improvement, comprehensive work planning, and time management. Each course included multiple files (e.g., PDFs), images, videos, interviews, documents, links, and downloadable resources. To keep these materials organised for the consortium and contributors, a dedicated file structure was maintained for the images used in each course, including captions, short descriptions, alt text, and source or copyright information (Figure 6). This made it easier to place visuals correctly, verify that all necessary information was available, and reuse materials consistently across courses where relevant, and comply with intellectual property and the project's data management.

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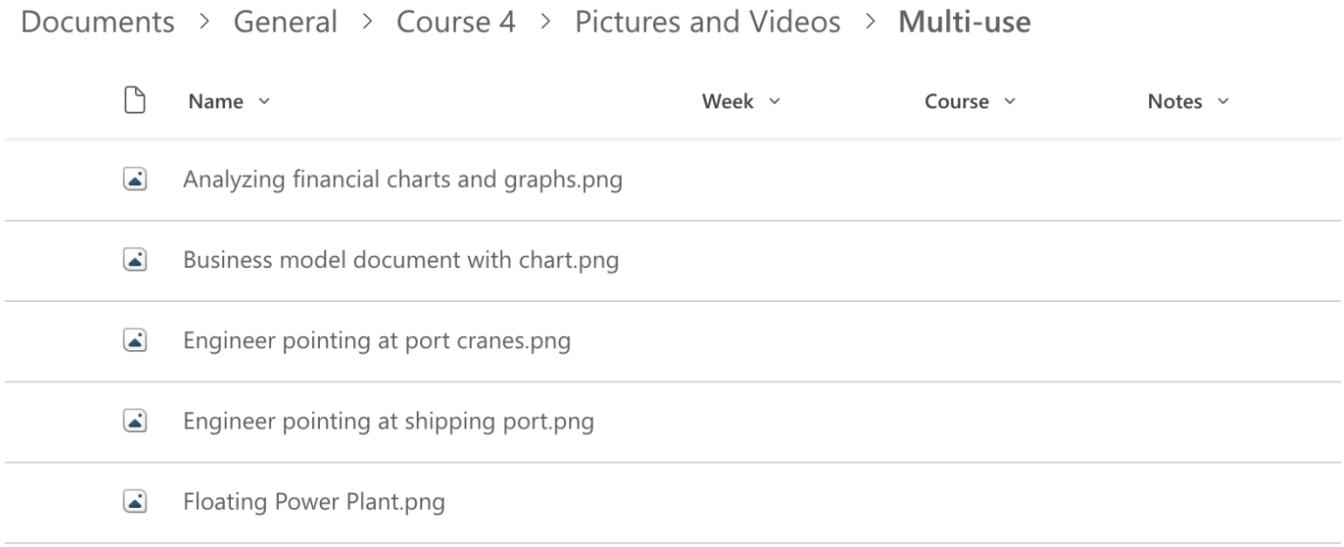

FIGURE 6. PICTURES FILE

A similar approach was followed for videos, recorded interviews, PDFs, and other downloadable files. This helped the team identify which file belonged to which step, verify that links and resources were functioning correctly, and replace files efficiently when needed. A further lesson from implementation was the value of integrating produced videos directly into the course environment where possible, rather than relying only on external links. This reduced the risk of broken links and improved the long-term stability of the learning materials. The same applied to PDFs and other downloadable resources. By uploading them directly to the platform, where possible, the consortium ensured that the materials remain accessible and operational over time.

Overall, the implementation process developed progressively from Course 1 to Course 5. It was not based on a fully fixed procedure from the outset, but improved through practice, feedback, and iteration. Over time, the consortium established a clearer system for preparing course overviews, structuring content, managing assets, assigning educators, issuing certificates, conducting quality checks, and aligning all materials with the platform's requirements. This gradual improvement was one of the main lessons from the publication process and contributed to a more efficient, consistent, and professional implementation of the courses.

3.7 Subcontracted implementation support

The implementation phase was supported by a subcontractor, BonoLab[4], engaged by SUBMARINER Network under a service contract covering a defined set of delivery tasks. Drawing on established experience in designing and delivering online open courses, BonoLab helped transfer the consortium's content into the published platform version, prepared the data analytics reports, and filmed and edited a number of the expert interview videos. This arrangement functioned as an extension of the consortium's own quality assurance. The consortium and its external experts provided the scientific, thematic, and sector-specific substance, while this complementary know-how in learner flow and presentation consistency helped each course meet the platform's Quality Assurance Criteria efficiently and to a consistent standard across the portfolio.

[4] BonoLab ApS, https://bonolab.com.

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3.8 Publication of the courses

Once each course had gone through the full implementation and quality assurance process, it was submitted for publication on FutureLearn. This included several review circles to prove that the course structure and content were complete, that the course overview was accurate, that certificates were prepared, that educators and course team members were assigned correctly, and that the relevant website and communication materials were ready. The publication process also required sufficient planning time, as each course needed to be submitted to FutureLearn in advance. In practice, the review and publication cycle took approximately four weeks per course.

The implemented Blue Bio Techpreneurs MOOC consists of five publicly available courses published on FutureLearn. These are:

Course 1: Introduction to Blue Bioeconomy Entrepreneurship

This course introduces learners to the blue bioeconomy and explores how marine resources can support innovation, entrepreneurship, and sustainable business development. It covers blue entrepreneurship, business idea generation, role models, creativity, resilience, funding, legal structures, and stakeholder engagement. The course had 1,246 enrolled learners as of August 2026.

Course 2: Beyond the Shore: Innovating the Blue Bioeconomy on Land

This course focuses on land-based aquaculture and its role in the blue bioeconomy. It introduces learners to systems such as recirculating aquaculture systems, algae-based innovation, circular economy approaches, business models, and career opportunities connected to land-based blue innovation. The course had 604 enrolled learners as of August 2026.

Course 3: Navigating the Blue Bioeconomy: Innovation and Entrepreneurship in Coastal Aquaculture

This course explores coastal aquaculture as a driver of blue bioeconomy innovation and entrepreneurship. It covers sustainable aquaculture practices, marine biomass-based products, algae applications, business models, funding, compliance, intellectual property, and future career pathways in the sector. The course had 539 enrolled learners as of August 2026.

Course 4: Integrated Ocean Planning: Marine Protected Areas, Multi-Use & Business Pathways

This course connects marine protected areas, maritime spatial planning, ocean multi-use, and sustainable business development. It introduces learners to the relationship between conservation, governance, ecosystem services, business models, and career pathways in integrated ocean management. The course had 513 enrolled learners as of August 2026.

Course 5: Blue Biotechnology Entrepreneurship and Careers: Innovation to Impact

This course focuses on blue biotechnology and the process of turning marine science into sustainable business and career opportunities. It covers marine organisms, blue biotech applications, technological processes, intellectual property, market development, financing, entrepreneurship, skills, and collaboration between science and industry. The course had 853 enrolled learners as of August 2026.

This confirms that the original five-course ambition described in Deliverable 2.3 was fully implemented. The published portfolio also shows that the MOOC has evolved into a broad, thematic educational offering. It combines introductory entrepreneurship content with more specialised perspectives on blue biotechnology, aquaculture, ocean planning, land-based innovation, business models,

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sustainability, skills, and career pathways. This diversity of topics is important because it reflects the interdisciplinary nature of the blue (bio)economy and enhances the MOOC's accessibility to learners with diverse interests, backgrounds, and professional goals.

After publication on FutureLearn, the courses were also made visible through the Blue Bio Techpreneurs website (Figure 7). The project team prepared an online course page including the full course list and direct links to each course, allowing learners and stakeholders to easily access the full MOOC portfolio. The publication of the courses was followed by targeted online promotion. The team promoted the courses through social media, particularly LinkedIn and BlueActionMatch, using posts that introduced course topics in an educational and accessible way (Figure 8). These posts highlighted the relevance of the course themes and included calls to action encouraging learners to register and enrol. This helped increase visibility, reach new audiences, and support learner engagement.

FIGURE 7. WEBSITE MOOC PAGE

FIGURE 8. LINKEDIN PROMOTIONAL EXAMPLE

In addition, communication activities were extended through universities and partner networks. Emails and promotional messages were prepared and shared with relevant educational networks in order to reach higher education institutions, students, early-career professionals, researchers, and other potential learners interested in the blue bioeconomy.

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The MOOC was also promoted at events targeting its intended audience, particularly those focused on blue careers. Project partners showcased the course as part of their institutional presentations and participation in these events, thereby increasing its visibility among relevant stakeholder communities. This was important to ensure that the MOOC reached not only the project's immediate audience but also wider educational and professional communities. More detailed analytics and course-specific information are presented in Annex 1.

3.9 Maintenance and facilitation

After publication, we continued to monitor and maintain the courses to ensure that the learning experience remained clear, accessible, and functional. This was important because the MOOC was designed as an open, self-paced learning offer, meaning learners could continue joining and progressing through the courses after publication.

One important element of maintenance was the regular review of learner comments. FutureLearn allows learners to interact through comments across many course steps, creating opportunities for reflection, discussion, and peer-to-peer exchange. The subcontractor monitored these comments to identify whether learners had questions, whether any information needed clarification, or whether any technical or content-related issues were emerging.

In addition to comment monitoring, the team conducted regular checks of course content. This included reviewing links, pages, downloadable resources, videos, and supporting materials to make sure that all elements remained accessible and up to date. In April 2026, the team conducted a more detailed course check to identify missing links, broken pages, and materials that needed correction or replacement. This process supported a soft relaunch of the courses, ensuring that the published content remained accurate and functional for new and existing learners.

Course maintenance also provided an opportunity to improve and enrich the learning materials. During this period, the consortium uploaded and integrated additional video interviews produced after the initial publication phase (Figure 9). Including more internally produced videos strengthened the courses by adding expert voices, project-specific perspectives, and original learning materials. It also reduced reliance on external video links, thereby improving the long-term stability of the course content.

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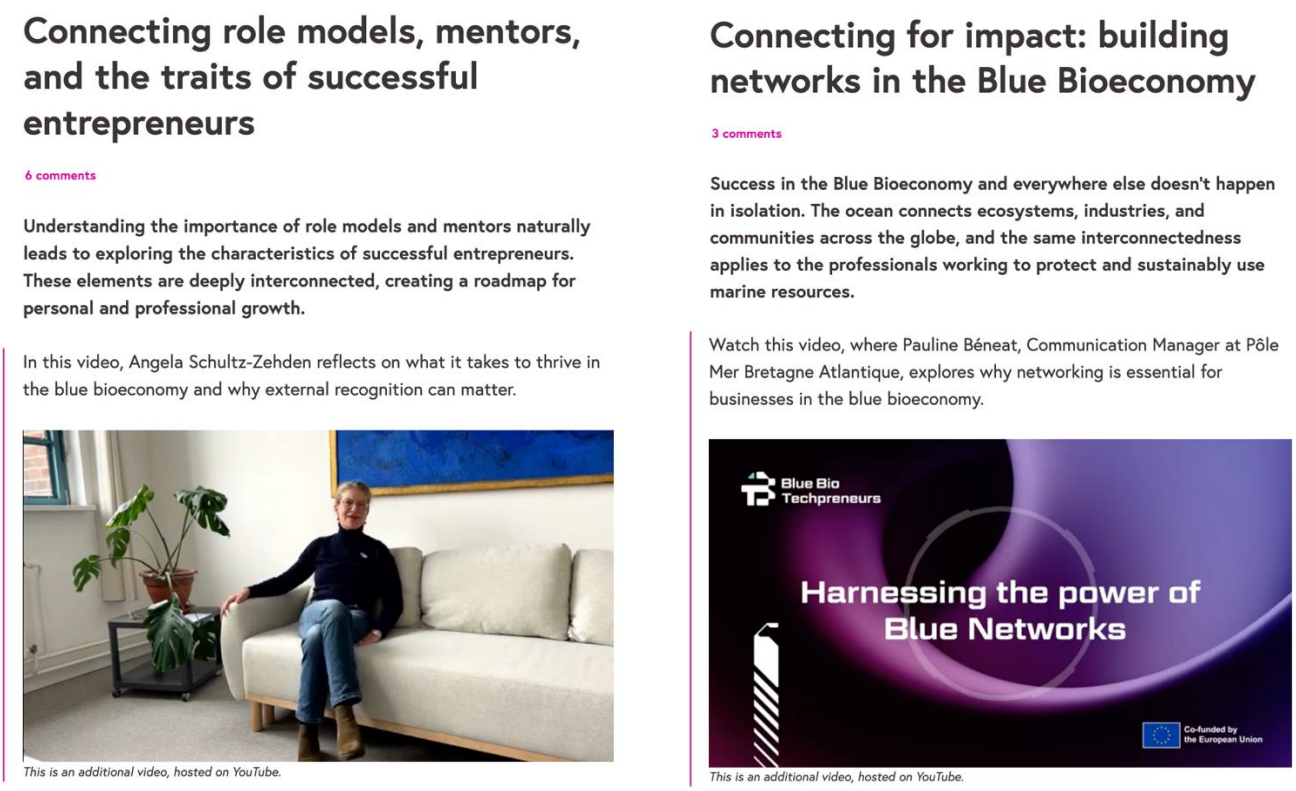

FIGURE 9. INTERVIEWS ADDED AFTER THE REVISION

Overall, maintenance and facilitation were important parts of the MOOC implementation process. They helped ensure that the courses remained active, reliable, and responsive to learner needs, while also allowing the consortium to continue improving the learning experience after publication.

3.10 Outreach

Outreach achieved solid take-up within the MOOC's intended European audience, with the United Kingdom, Italy, Germany, Spain, and Portugal consistently among the leading source countries across the portfolio. Alongside this European core, the openly published courses also drew international interest, with India the largest single non-European source country. This indicates the content's relevance was not bound by its original target geography.

4. IMPACT

The early impact of the Blue Bio Techpreneurs MOOC can be observed on five levels: legacy, reach and outreach, exploitation, community building, and career skills and professional recognition.

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Level 1: Legacy

The MOOC creates a lasting educational legacy for the project. Deliverable 2.3 had already noted that hosting the courses on a professional MOOC platform would make them available in Europe and worldwide beyond the project lifetime. This has now been realised through the publication of the five courses on FutureLearn, where learners can continue to access the materials online and at their own pace and for free. In addition, the courses are contracted to remain live on FutureLearn for a further year beyond the formal end of the project, and also the full source content of all five courses is held and owned by the consortium independently of the platform, which means the material can be reused, adapted, and republished in other formats or on other platforms once the current hosting arrangement ends.

The legacy of the MOOC is also supported by the wider set of materials created during implementation, including course texts, videos, interviews, downloadable resources, communication materials, and related promotional content. These resources help ensure continuity beyond the project period and increase the long-term value of the project's educational outputs.

In addition, the MOOC has been made visible through external education and training platforms, such as MarineTraining, where the course is listed as an additional access point for learners interested in blue bioeconomy and entrepreneurship education. This strengthens the discoverability of the MOOC and helps connect it to wider marine and blue economy learning communities.

Level 2: Reach and outreach

The MOOC increases the visibility of blue bioeconomy entrepreneurship and careers by offering a structured, accessible learning pathway to learners who may not already be part of specialist networks. The five-course portfolio reaches the project's target groups, including students, researchers, entrepreneurs, early-career professionals, and stakeholders from different blue economy sectors.

The courses were promoted through the Blue Bio Techpreneurs website, social media channels, LinkedIn posts, partner networks, and wider blue economy communication channels. In particular, the project used educational social media posts to introduce course topics, explain their relevance, and encourage learners to register and enrol. The MOOC was also promoted through BlueActionMatch, which includes around 1,700 users from different blue economy sectors, helping the courses reach a broader professional community.

In addition, we shared information about the courses with university networks and relevant educational institutions. This helped extend the MOOC's reach to students, lecturers, and early-career professionals in fields related to the blue bioeconomy, marine biotechnology, aquaculture, sustainability, and entrepreneurship.

The variety of topics covered across the five courses also supports wider outreach. The portfolio combines introductory entrepreneurship content with more specialised themes, including land-based aquaculture, coastal aquaculture, marine protected areas, ocean planning, blue biotechnology, business models, skills, and career pathways. This breadth of themes makes the MOOC relevant to learners with varying levels of prior knowledge and professional interests.

Level 3: Exploitation

The MOOC contributes to capacity building by translating the expertise and results of the Blue Bio Techpreneurs project and related initiatives into reusable educational content. It reflects the original aim of combining blue bioeconomy knowledge with entrepreneurial, digital, sustainability, and

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transversal competences relevant to future careers and innovation pathways. The courses also create exploitation potential for the project partners and the wider blue economy ecosystem. They can be used as learning resources for students, training materials for early-career professionals, supporting content for university courses, or introductory material for stakeholders entering the blue bioeconomy sector. By integrating blue businesses, real-world cases, expert interviews, concepts, and project examples, the MOOC increases visibility of career and business opportunities in the blue bioeconomy. The MOOC, therefore, functions not only as a dissemination output but also as a practical exploitation tool. It transforms project knowledge into an accessible educational asset that can continue to support skills development, awareness raising, and talent attraction beyond the project's formal lifetime.

SDU has already begun exploiting the Blue Bio Techpreneurs MOOC as a transferable educational resource beyond the project itself. Within the Danish-funded African Blue Futures programme (DANIDA), the MOOC and accompanying BBT webinars are being integrated as preparatory learning activities for students participating in an international Blue Economy Hackathon in Tanzania. This blended-learning approach allows participants to establish a common knowledge base through self-paced online learning before applying their competences in interdisciplinary innovation challenges and international collaboration.

Building on this experience, SDU is further developing a proposal to integrate selected MOOC modules into a multidisciplinary educational framework within the EPICUR University Alliance. The objective is to use the BBT learning materials as shared digital resources that complement challenge-based teaching across European universities, demonstrating how project-generated educational content can be reused, adapted, and embedded in new international learning environments long after the project's completion.

The University of Gdańsk (UG) is exploring the use of the Blue Bio Techpreneurs MOOC as a transferable educational resource by integrating selected MOOC materials into Bachelor-level Oceanography courses. The aim is to complement existing curricula with interdisciplinary knowledge on blue biotechnology, innovation, and sustainable ocean development. UG is considering procedures for using the MOOC either as external learning material or, where appropriate, as a recognised component, enabling students to combine flexible online learning with their academic studies.

Consortium partners with strong links to university and school communities, such as BlueBioAlliance (BBA), are expected to continue acting as ambassadors for the MOOC beyond the project's lifetime. By integrating the course into their educational and outreach activities, they will use it as a valuable component of their toolkit to support their ongoing mission to foster growth, promote opportunities, and strengthen capacity in the blue economy sector. In this way, the MOOC will remain a sustainable educational resource, extending its impact beyond the duration of the project.

Level 4: Community building

The MOOC has also contributed to community building around blue bioeconomy education and careers. Through FutureLearn's comment functions, learners can exchange ideas, reflect on course topics, and engage with peers from diverse backgrounds and countries. This has fostered a learning community around shared interests in sustainability, marine innovation, entrepreneurship, and blue careers.

During the publication and promotion of the courses, the consortium also observed connections between the MOOC and other Blue Bio Techpreneurs activities. Some learners discovered the courses through BlueActionMatch, LinkedIn, project communication activities, or by applying to our Ambassador Programme, as further explained in Annex 1. This indicates that the MOOC helped create pathways between learning, networking, and active participation in the project community. In this way,

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the MOOC has supported not only knowledge transfer but also the development of a broader community of learners, professionals, and emerging actors in the blue bioeconomy.

Level 5: Career skills and professional recognition

A further area of impact relates to career skills and professional recognition. The Blue Bio Techpreneurs project aims to help bridge the gap between skills development and labour market needs in the blue bioeconomy. The MOOC contributes to this objective by offering learners structured knowledge on blue biotechnology, aquaculture, sustainability, entrepreneurship, innovation, and career pathways.

One visible sign of this impact has been learners sharing their course certificates on LinkedIn (Figure 10). This shows that participants value the certificate not only as proof of course completion, but also as a way to communicate their newly acquired knowledge and interest in the sector to professional networks and potential employers. In this sense, the certificates support learners in demonstrating their engagement with blue bioeconomy topics and their commitment to developing relevant skills.

By completing the courses and sharing their certificates, learners can signal that they have developed a stronger understanding of the blue bioeconomy and its related business, sustainability, and innovation dimensions. This is particularly important for students, early-career professionals, and individuals seeking to enter or progress within the blue economy. Over time, the MOOC can therefore contribute to improving employability, strengthening career awareness, and developing a more skilled talent pool for the sector.

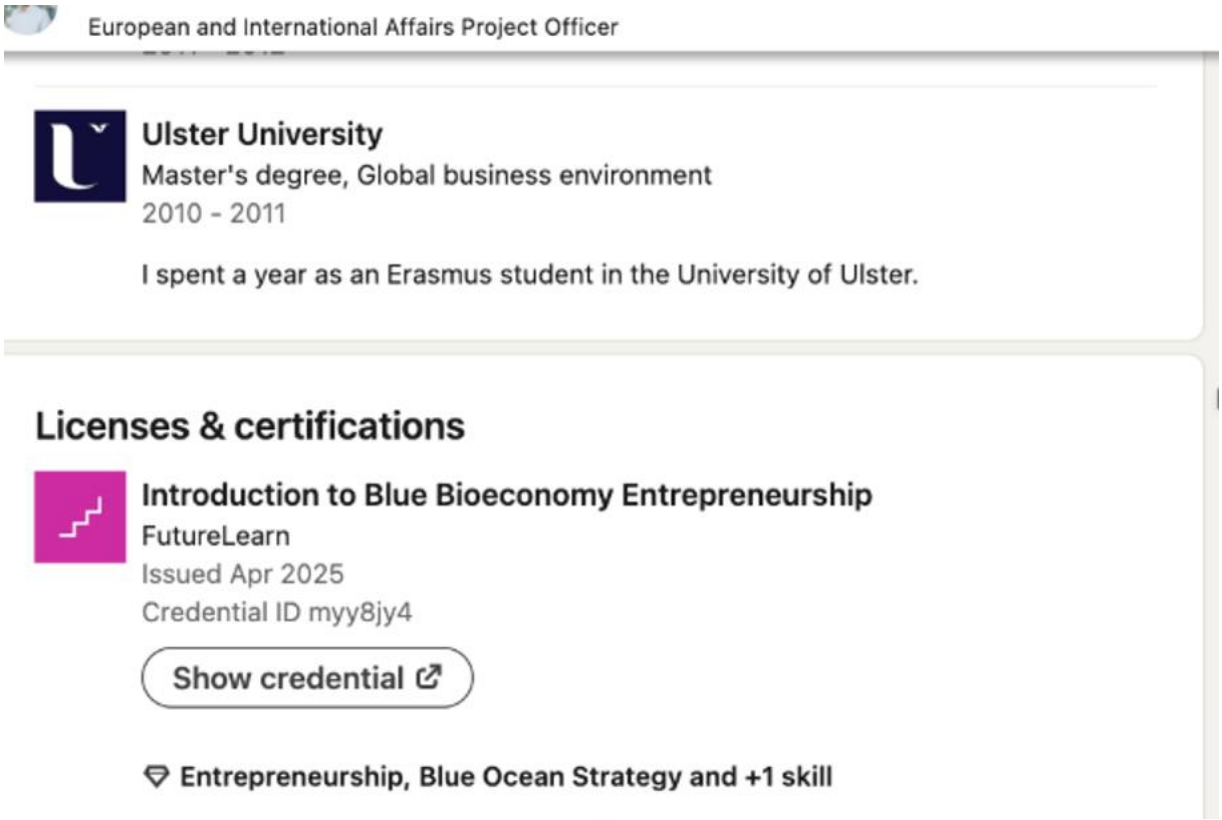

FIGURE 10. ADDING THE COURSES TO LINKEDIN SKILLS

The impact of a tool such as this is expected to extend well beyond the project's duration. By providing accessible, high-quality learning opportunities and consolidating knowledge related to the blue

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economy sector, the MOOC has the potential to remain a valuable resource for learners, educators, professionals, and other relevant stakeholders. Its continued use by consortium partners will contribute to the long-term promotion and visibility of the sector, supporting awareness-raising activities, encouraging the development of key competencies, and helping to attract new generations of talent towards blue careers.

Recognising the MOOC's contribution to capacity building, knowledge dissemination, and sectoral engagement, partners will be able to continue capitalising on this resource as part of their educational, institutional, and outreach activities. Through their established networks and connections with academic communities, schools, and other stakeholders, they will further disseminate the opportunities offered by the blue economy and promote the skills and career pathways required for its future development. In this way, the MOOC will constitute a lasting legacy of the project, ensuring that its outcomes continue to generate value and impact beyond the project's formal timeframe.

Furthermore, the open and free access to knowledge provided through the MOOC represents an important contribution to promoting equal access to learning opportunities within the blue economy sector. By removing financial and geographical barriers, the course enables a wider and more diverse range of learners to access high-quality educational content, regardless of their location, background, or previous opportunities for engagement with the sector. This inclusive approach is particularly relevant in a rapidly evolving field where access to up-to-date knowledge, skills development, and career information can play a decisive role in enabling individuals to participate in emerging professional pathways. By democratising access to sector-specific expertise and resources, the MOOC supports not only capacity building but also the diversification of the future blue economy workforce, encouraging greater participation from new audiences and contributing to the development of a more inclusive, skilled, and resilient sector.

5. LEARNER ENGAGEMENT

FutureLearn is built around the principle of social learning, and provides a number of tools designed to encourage learners to engage with one another rather than progress through a course in isolation. Comments are the platform's central social learning mechanism and can be enabled on most step types, allowing learners to reflect, ask questions, share perspectives, and reply directly to one another throughout the learning journey rather than only at isolated discussion points. Alongside comments, the platform's polls, quizzes, and exercises give learners a way to see how their own responses compare with those of the wider cohort, offering a further, lower-effort form of social comparison even where a learner does not comment directly.

5.1 Engagement across the portfolio

Across the five published courses, learners left a combined total of 2,754 comments (Table 1). Comment volume, the number of unique commenters, the proportion of comments that were direct replies to another learner, and the concentration of activity among the most active learners are summarised below.

TABLE 1. THE 5 MOOC SOCIAL LEARNING STATISTICS

Course	Comments	Commenters	Reply rate	Top-10 concentration

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1 Blue Bioeconomy Entrepreneurship	1,229	132	7.6%	57.1%
2 Beyond the Shore (Land-based)	290	47	4.8%	66.2%
3 Coastal Aquaculture	348	59	4.6%	72.7%
4 Integrated Ocean Planning	244	52	2.9%	65.2%
5 Blue Biotechnology Careers	643	90	0.2%	65.9%

5.2 Sustained engagement beyond each course's launch period

Comment-level timestamp data for Courses 1–5 shows that engagement was not confined to each course's initial launch period. Most courses recorded renewed spikes in comment activity well after publication, indicating that the self-paced, evergreen format continues to attract new learners over time. Course 2 is the partial exception: it peaked early, in June 2025, and saw only a modest rebound in April 2026 rather than a distinct second wave. Course 3 recorded two distinct peaks several months apart, in August and November 2025. Course 4 is the clearest example of engagement driven by new learners rather than a fading launch cohort: after peaking in October 2025, it saw a fresh wave of comments in April and May 2026, seven to eight months after launch. Course 5's own reporting shows the same pattern at a larger scale: only 46% of its comments fall within the first five weeks after launch (its defined active delivery window), with the remaining 54% arriving over the following five months.

5.3 Learner voices

Comments across the portfolio show learners engaging thoughtfully with course content, frequently connecting concepts to their own professional goals or correcting one another's misconceptions unprompted:

"Blue Bioeconomy is a new topic which I am hearing for the first time." — **Course 1 learner**

"One misconception about RAS is that it is only about compliance… it neglects its broader role in identifying and mitigating risks to improve overall business performance." — **Course 2 learner**

"The idea of underwater farms really made me think. There isn't one single solution to global food production, but combining different approaches like regenerative ocean farming could make a significant difference." — **Course 3 learner**

"I think one of the main challenges to achieving the 30x30 goals is ensuring effective management and enforcement of MPAs, not just expanding them." — **Course 4 learner**

"This course was an extremely valuable and inspiring experience for me. From gaining a strong foundation in marine biotechnology to developing a deeper understanding of entrepreneurship, sustainability, and leadership in the blue bioeconomy, the content was well-structured, practical, and highly relevant." — **Course 5 learner**

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5.4 What worked across all courses

- The "Tell us about you" / introduction step was the single strongest engagement driver everywhere, highest comment volume and, in most courses, the highest reply rate too. Personal storytelling consistently outperformed technical prompts.
- Content-based reflection was strong: learners paraphrased concepts accurately and connected them to real cases (Kingfish, Oceanloop, TETRAS, national MSP comparisons), showing genuine comprehension rather than box-ticking.
- The long asynchronous tail (most comments arrive well after the "active" delivery window, 78–79% in Courses 3 and 4) confirms the self-paced, evergreen model is working as designed.

5.5 Summary

Taken together, the data shows a MOOC portfolio that succeeded in engaging learners individually with its content, generating thoughtful, applied reflection throughout, with learner-to-learner interaction the one area that did not grow at the same pace across the five courses. This is the clearest design opportunity identified by the data, and is taken up in Lessons Learned and Recommendations.

6. LESSONS LEARNED

Several lessons emerged from the MOOC implementation process.

The first lesson is that **planning and platform alignment need to begin early**. Developing a MOOC for a professional platform requires more than preparing educational content. The course must also follow a professional structure, technical requirements, quality criteria, and learner-facing format. This means that course overviews, weekly structures, step types, educator profiles, certificates, images, links, downloadable files, and communication materials all need to be planned in advance. The implementation process showed that early planning reduces delays, avoids missing information, and makes publication more efficient.

A second lesson is that **content development and digital implementation are distinct phases**. A course may be academically strong and thematically relevant, but still require significant adaptation before it works effectively as an online learning experience. During implementation, the team transformed expert content into digestible formats of weeks, activities, and steps. This required attention to pacing, learner navigation, variety of steps, accessibility, tone, and the overall learning journey. This was already anticipated in Deliverable 2.3 and was confirmed in practice.

A third lesson is that **structured templates and quality assurance processes are essential**. The use of internal Word templates, checklists, course design files, and Course Quality Assurance helped the consortium prepare and review the courses before uploading them to the platform. This reduced the need for major changes directly in the digital format and helped avoid formatting mistakes, missing files, or incomplete and incoherent sections. It also made it easier to coordinate work across partners and contributors.

A fourth lesson is that **strong editorial coordination is indispensable when many contributors are involved**. Scientific and sector-specific expertise were central to the quality of the MOOC, but they were not sufficient on their own. The courses also required consistency in language, structure, learner flow,

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visual presentation, and pedagogical logic. Editorial coordination was therefore necessary to bring together contributions from different partners, experts, organisations, and related projects into one coherent learning experience.

A fifth lesson is that **specialised digital learning expertise can add clear value**. Bringing in specialist support for online learning design and sustainability-oriented educational experiences added a perspective that reinforced the consortium's competencies. This support helped translate project knowledge and expert input into a more learner-friendly course environment. It also helped bridge the gap between thematic expertise and the practical requirements of digital course delivery.

A sixth lesson is that **a modular five-course structure is effective**. Rather than forcing all topics into a single large course, the final structure offered multiple entry points for learners. This made the MOOC more accessible to people with different levels of prior knowledge, interests, and professional goals. Learners could begin with the introductory entrepreneurship course or move directly into more specialised topics such as land-based aquaculture, coastal aquaculture, ocean planning, or blue biotechnology.

A seventh lesson is that **interactivity and learner engagement must be built into the course design**. The combination of articles, videos, interviews, quizzes, exercises, reflection prompts, and discussions sustained learner engagement and supported applied understanding. FutureLearn's comment functions were especially valuable because they allowed learners to reflect, share perspectives, and connect course content to their own context.

An eighth lesson is that **maintenance must be treated as part of the implementation process**. Publication is not the final step. After the courses were launched, it remained important to monitor learner comments, check links, review downloadable resources, update content where necessary, and ensure that videos, PDFs, and other materials remained accessible. Maintaining the courses helped ensure the MOOC continued to function properly and remained useful for new learners who joined after publication.

A ninth lesson is that **promotion and community building are crucial for impact.** A MOOC only creates value if learners can find it, understand its relevance, and feel encouraged to join. Promotion through the project website, LinkedIn, partner networks, university contacts, BlueActionMatch, webinars, and related community activities helped increase the visibility of the courses. At the same time, the MOOC supported community building by connecting learners with shared interests in the blue bioeconomy, entrepreneurship, sustainability, and career development.

A tenth lesson is that **using an established learning platform** can significantly strengthen visibility, credibility, and outreach. Hosting the MOOC on FutureLearn offered clear advantages compared with publishing the courses on a smaller local or project-specific website. Well-known international online learning platforms, provide an existing learner base, a professional course environment, recognised quality standards, and greater discoverability. This helped position the MOOC as a credible learning offer beyond the immediate project network. This confirmed the value of choosing a recognised platform not only for delivery, but also for dissemination and impact.

An eleventh important lesson learned is the value of developing the MOOC on a **flexible and platform-independent basis**, allowing for broader application and future integration across different learning platforms. Designing the course with adaptability in mind ensured that its content, structure, and resources could be reused and disseminated through other platforms, maximising its long-term impact and sustainability.

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7. RECOMMENDATIONS

Based on the implementation experience and the early results of the MOOC, several recommendations can be made to support its continued use, visibility, and long-term value.

1. Keep the MOOC visible beyond the project lifetime

The courses should continue to be promoted after the formal end of the project. A MOOC can only generate long-term impact if learners can find it, understand why it is relevant to them, and take the course. Continued communication through the platform communication channels, Blue Bio Techpreneurs website, partner websites, newsletters, social media, events, webinars, and other blue economy channels will therefore remain important. In addition, universities and educational institutions that consider the course materials relevant should be encouraged to share them with students and integrate them into their own learning activities where appropriate.

BlueActionMatch (formerly BlueBioMatch) can also serve as a long-term channel to connect the MOOC to the wider blue economy community. Since the platform already attracts users from different blue economy sectors, it can help direct learners to courses and, at the same time, offer course participants a way to remain connected after completing the MOOC.

2. Strengthen links with universities and career-oriented education

The MOOC should be further shared with universities, lecturers, programme coordinators, and career offices working in fields such as marine science, biotechnology, aquaculture, sustainability, entrepreneurship, circular economy, innovation, and blue economy studies. The courses can be used as complementary learning materials, optional assignments, introductory resources, or career development tools. This is particularly relevant because the Blue Bio Techpreneurs project aims to address the gap between skills development and labour market needs. By making courses more visible in educational settings, the MOOC can support students and early-career professionals in building knowledge that is relevant to future blue bioeconomy careers.

3. Design courses to actively encourage learner-to-learner interaction

As set out in Learner Engagement, learners across all five courses engaged strongly with course content but rarely with each other. Discussion prompts largely invited standalone reflection rather than peer exchange, and engagement was concentrated among a small core of learners in every course. Future course design should build in structured opportunities for comparison, critique, and reply, for example, prompts that ask learners to respond to a peer's post rather than simply share their own view, alongside light-touch facilitator seeding in the opening weeks to model this kind of exchange.

4. Promote certificates as evidence of skills development

The certificates offered through the courses should be presented as a useful tool for professional visibility. Some learners have already started sharing their certificates on LinkedIn, which shows that they see value in using it to demonstrate their engagement with the blue bioeconomy. Future communication should therefore highlight the certificate not only as proof of course completion, but also as evidence of knowledge development in areas such as blue biotechnology, aquaculture, entrepreneurship, sustainability, innovation, and career pathways. This can help learners communicate their interests and skills to employers, universities, and professional networks.

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5. Maintain the courses as accessible and reliable learning resources

The courses should continue to be reviewed periodically to ensure that links, videos, PDFs, images, downloadable resources, and examples remain accessible and up to date. This is especially important for an online course intended to remain available beyond the project's lifetime. Where possible, important materials should be hosted directly on stable platforms rather than relying only on external links. This will reduce the risk of broken resources and help ensure that learners can continue to access the full course experience in the future.

6. Position the MOOC as a transferable model for future EU projects

The Blue Bio Techpreneurs MOOC can serve as a good practice example for other EU-funded projects that want to turn project knowledge into lasting educational outputs. The experience shows that project results, expert knowledge, case studies, and community activities can be transformed into accessible online learning materials when they are supported by a clear structure, professional delivery, and coordinated implementation. This model could be replicated by other projects in the blue economy, sustainability, innovation, and skills development fields. It demonstrates how a project deliverable can become more than a reporting output and instead develop into a practical resource with long-term educational and dissemination value.

7. Explore a shared European space for blue bioeconomy learning

In the longer term, there is a need for a more coordinated European space for blue bioeconomy education, skills, and career development. Such a platform could bring together MOOCs, training materials, career guidance, job profiles, testimonials, skills frameworks, and community opportunities. This could also create a mechanism for different projects to publish educational materials according to shared quality standards, making them easier to find, compare, and reuse. Future initiatives, such as the EIT Water, could provide an opportunity to explore this type of coordinated educational and career development platform. Overall, the key recommendation is to treat the MOOC as a long-term educational and community asset.

8. Content legacy beyond FutureLearn

The value of this content should not be seen as tied to the lifetime of the FutureLearn hosting arrangement. Across the five courses, the consortium and its contributors produced a substantial body of well-researched, carefully structured material covering blue bioeconomy entrepreneurship, land-based and coastal aquaculture, integrated ocean planning, and blue biotechnology. It would be a considerable loss if this content effectively disappeared once the current FutureLearn contract period ends. That risk has, however, been anticipated: the full source content for every course was captured and maintained independently throughout development. The MOOC material can continue to be used, adapted, and republished well beyond the current hosting arrangement. Further to exporting the content to other platforms, the source material could be repurposed into a range of smaller, more targeted learning resources, such as new e-learning courses, standalone toolkits, short micro-courses, workshop materials, or webinar content, designed to work across different platforms and formats.

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8. CONCLUSION

The Blue Bio Techpreneurs MOOC has successfully progressed from a planned educational concept to an implemented public learning offer. What Deliverable 2.3 set out as a planned educational concept now exists as five courses, published and freely accessible on FutureLearn. Together they cover the full thematic range the project is committed to, from entrepreneurship fundamentals through land-based and coastal aquaculture, marine protected areas and ocean planning, to blue biotechnology careers.

The result goes well beyond what was promised. The MOOC has reached 3,755 enrolments, and all five courses are still attracting new learners months after their launch. Learners left 2,754 comments across the portfolio, and course certificates are appearing on LinkedIn as evidence of skills gained.

The courses are already being taken up by SDU, which is integrating them as preparatory learning for the Blue Economy Hackathon in Tanzania under the African Blue Futures programme, and is developing a proposal to embed selected modules in the EPICUR University Alliance. The University of Gdańsk is exploring their use within Bachelor-level Oceanography teaching, and partners such as BlueBioAlliance will continue to carry the courses into their own educational and outreach activities.

The courses remain live on FutureLearn beyond the project's formal end, and the content is fully owned by the consortium and independent of the hosting platform. The MOOC is therefore not a deliverable that closes with the project but a working asset. It gives Blue Bio Techpreneurs a visible and durable educational legacy, contributes directly to the project's aim of narrowing the gap between skills development and labour market needs in the blue bioeconomy, and leaves partners with a resource they can continue to use, adapt, and extend.

ANNEXES

COURSE REPORTS

DIVERSITY

Due to the way FutureLearn's account structure works, it is not possible to confirm the overall percentage of women learners across the portfolio, and no official gender-disaggregated enrolment data is available from the platform (Table 2). As an approximation only, we cross-referenced learner comments (where a name was given and gender could be reasonably inferred) with the Facilitators' Dashboard. This produced the following counts, which should be treated as indicative at best, not as a verified figure.

TABLE 2. WOMEN IDENTIFIED

Course	Women Identified From Comments
1	40
2	10
3	29

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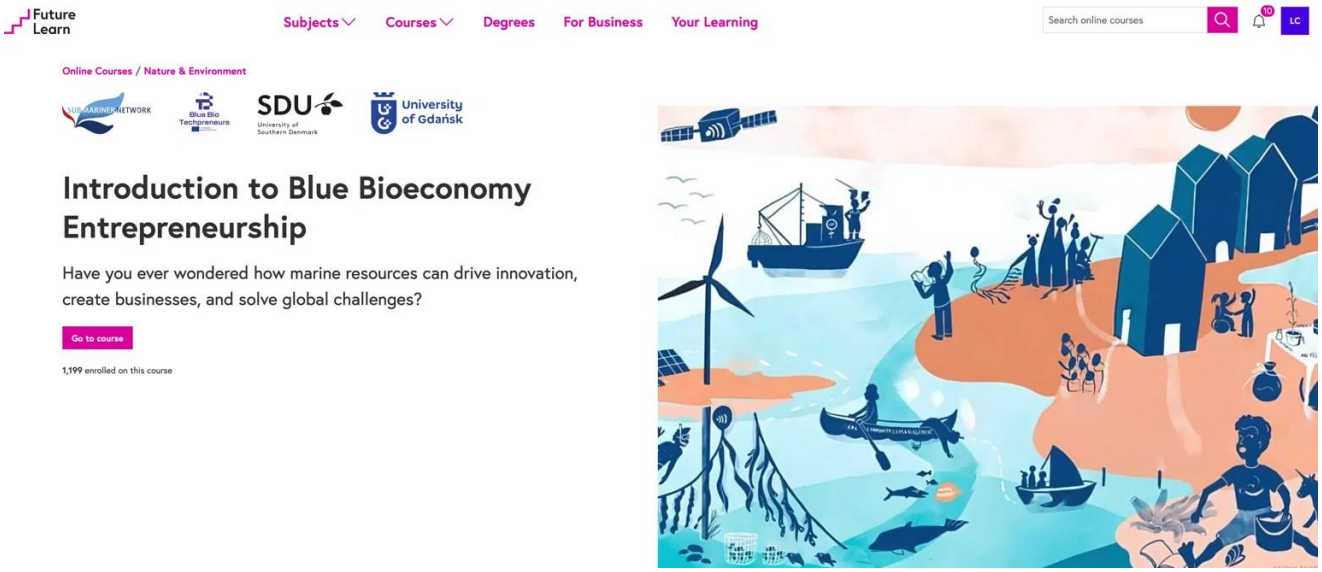
4	26
5	33

Not all learners leave comments, and even when they do, names do not always clearly show gender. Some names are used by people of different genders, and naming traditions vary a lot among our international learners. Because of this, the numbers here probably miss some participants, may not reflect the larger group of enrolled learners who do not comment, and should not be used to estimate the actual gender balance in the portfolio. We recommend not using these numbers as a percentage of total enrolment, since the group of learners whose gender could be identified is small and may not represent everyone.

COURSE 1: INTRODUCTION TO BLUE BIOECONOMY ENTREPRENEURSHIP

Course Summary



An entry-level course introducing the blue bioeconomy and how marine resources can drive innovation, business, and real-world solutions. Learners explore blue entrepreneurship, EU policy context, and marine living resources before moving into venture-building skills, value proposition, business model canvas, legal structures, and funding. Designed as the natural starting point for the whole portfolio (Figure 11).

Learning outcomes

- Evaluate the potential of marine resources in contributing to the Blue Bioeconomy
- Develop innovative business ideas by exploring case studies and analysing real-world data in the Blue Bioeconomy
- Explain the impact of key policies, regulations, and governance structures on entrepreneurial ventures in the Blue Bioeconomy
- Apply essential business skills — building a unique value proposition, business modelling, and stakeholder engagement

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- Assess various legal structures and funding sources for Blue Bioeconomy ventures
- Engage with industry networks and role models to enhance career pathways
- Develop an entrepreneurial attitude by practicing resilience and creativity

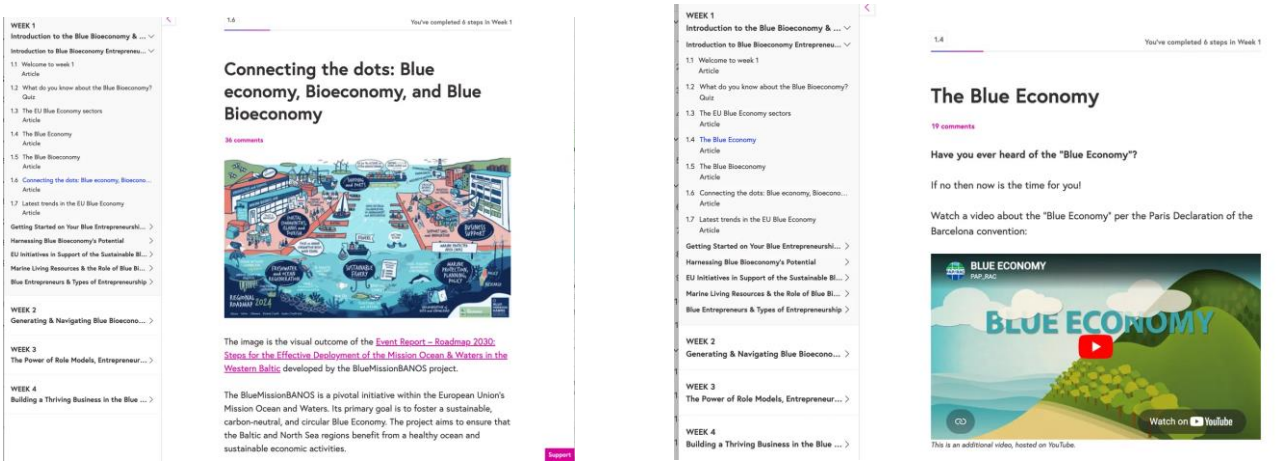

FIGURE 11. COURSE 1 EXAMPLE OF A STEP

Course 1 Statistics

Course 1 attracted the highest number of learners, and demonstrated a high run retention rate (Table 3).

TABLE 3. COURSE 1 GENERAL STATISTICS

Category	Statistics
Joiners	1246
Learners	1106
Learners with ≥50% step completion	278
Learners with ≥90% step completion	254
Run Retention Index: a measure of how the learner population moves through the entire course. The R-Index is the highest percentage of activated learners who've completed an equivalent portion of the course. e.g., an R-Index of 42.7% means that 42.7% of activated learners completed at least 42.7% of the course.	42.7%

Course 1 Demographics

Course 1 country of residence

The FutureLearn platform does not force the participants to confirm their country of residence. Learners can indicate their country in their profiles, and FutureLearn also assigns a country to them based on their IP address. With the widespread use of VPN services, the learner's actual location cannot be confirmed indefinitely. According to the available statistics, the learners came from across the globe (Figure 12). The EU countries with the highest representation are listed in Table 4.

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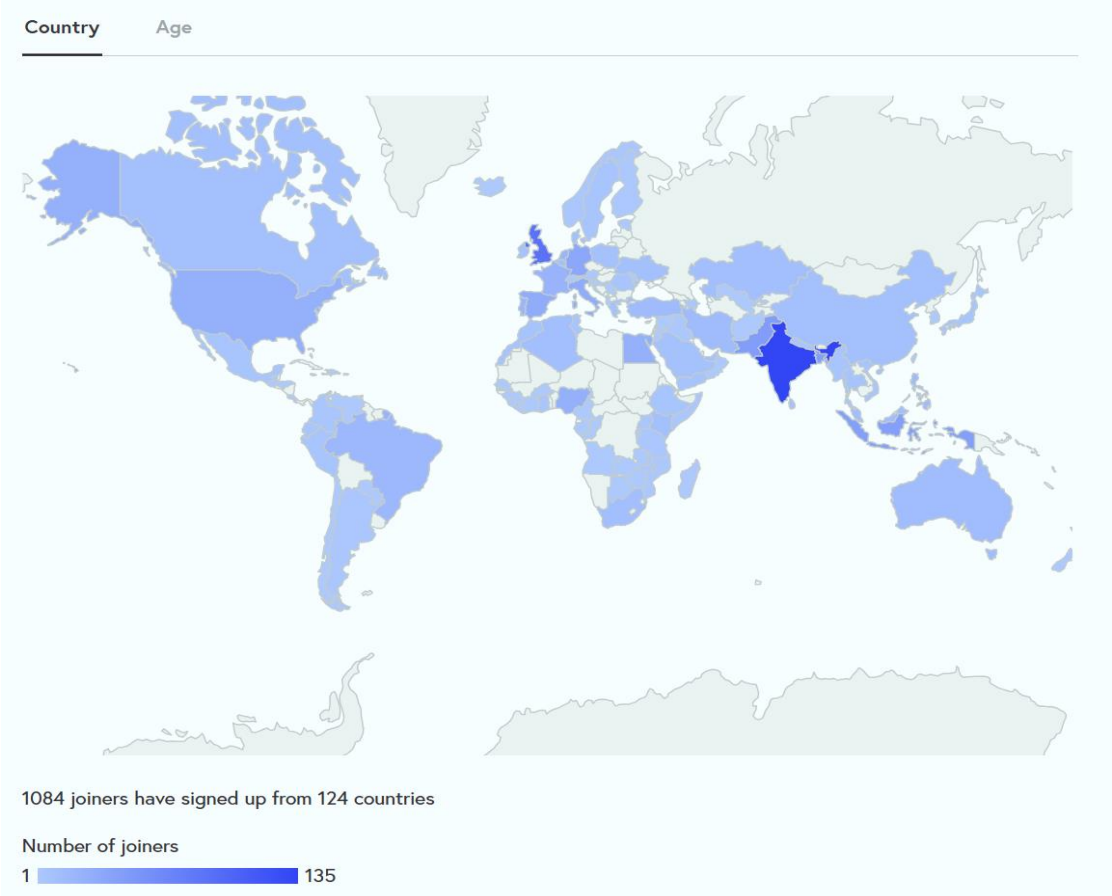

FIGURE 12. COURSE 1 LEARNERS' GLOBAL MAP

TABLE 4. COURSE 1 TOP 10 EUROPEAN COUNTRIES REPRESENTATION

Ranking	Country	Joiners	Active learners
1	United Kingdom	88	39
2	Germany	35	16
3	Italy	31	22
4	Spain	31	16
5	France	23	10
6	Netherlands	22	9
7	Portugal	21	12
8	Ukraine	11	8
9	Belgium	10	4
10	Poland	9	5

Course 1 learner age

The majority of learners choose not to share their age on their profiles. The few who shared their ages on their profiles indicate that the 26-35 and 36-45 age groups account for 10% of the age representation among learners for Course 1 (Figure 13).

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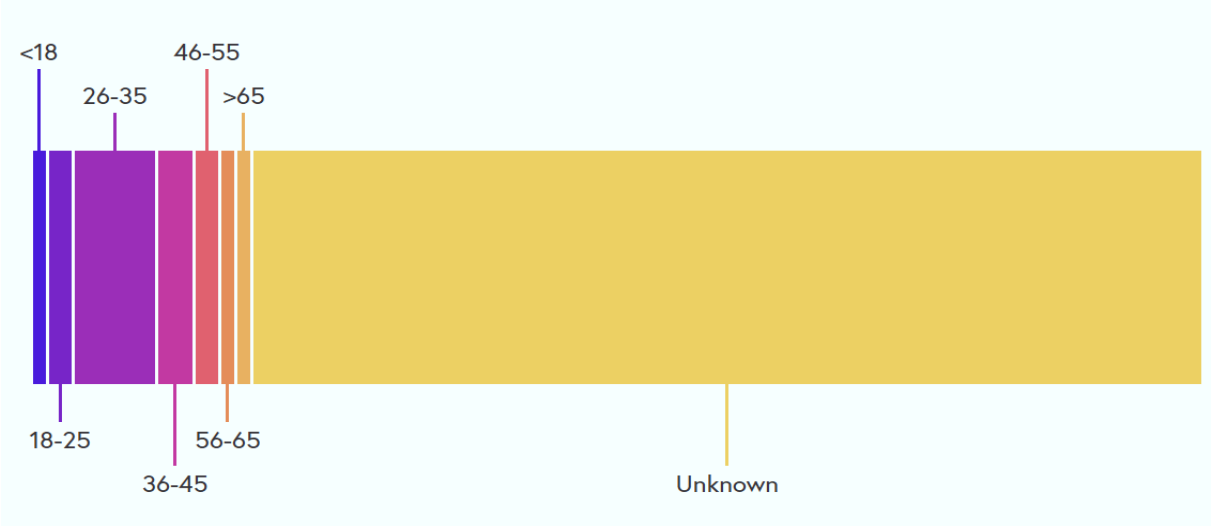

FIGURE 13. COURSE 1 LEARNERS' REPORTED AGE DISTRIBUTION

Learner background

Learners can indicate their background in their profiles – they also have an option to leave it unfilled or choose 'decline-to-answer' options. The course attracted a wide range of learners (Table 5).

TABLE 5. COURSE 1 PARTICIPANTS' BACKGROUND

#	Category	number
0	declined_to_answer	462
0	Unknown	286
1	environment_and_agriculture	87
2	business_consulting_and_management	55
3	science_and_pharmaceuticals	47
4	teaching_and_education	43
5	engineering_and_manufacturing	28
6	accountancy_banking_and_finance	27
7	public_sector	24
8	health_and_social_care	22
9	it_and_information_services	17
10	law	13
11	charities_and_voluntary_work	13
12	creative_arts_and_culture	11
13	retail_and_sales	11
14	marketing_advertising_and_pr	11
15	energy_and_utilities	8
16	recruitment_and_pr	6
17	armed_forces_and_emergency_services	4
18	media_and_publishing	4
19	hospitality_tourism_and_sport	2

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Course 1 Social Learning Review

Course 1 generated the highest comment volume of the portfolio, driven largely by its introduction step, which also recorded the strongest reply rate of any step across all five courses (21.2%), learners readily engaged with each other when introducing themselves, though this dropped off sharply on concept-focused steps later in the course. Learners frequently reflected on encountering the blue bioeconomy as an entirely new field, and connected course concepts to real EU initiatives and business models.

"Blue Bioeconomy is a new topic which I am hearing for the first time." — **Course 1 learner**

Course 1 End-of-Course Feedback

At the end of the course, learners are asked to provide feedback on their experience via a form, including an opportunity to share a free-text answer. The free-text option was not used by all respondents, and those who did generally focused on gratitude for the course. The same pattern appears across all 5 courses. Learner responses to the end-of-course survey are shown in Figure 14, Figure 15, Figure 16 and Figure 17.

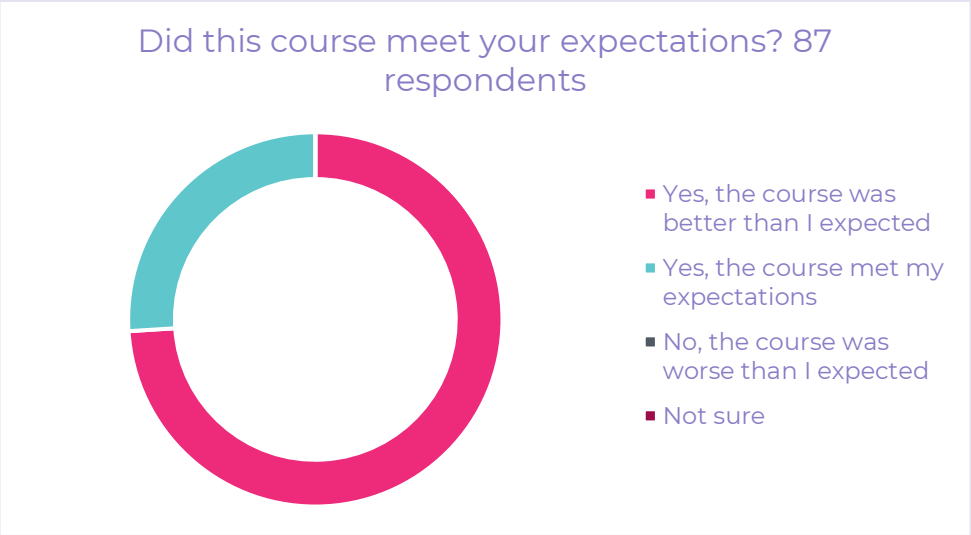

FIGURE 14. COURSE 1 END-OF-COURSE USER SATISFACTION SURVEY

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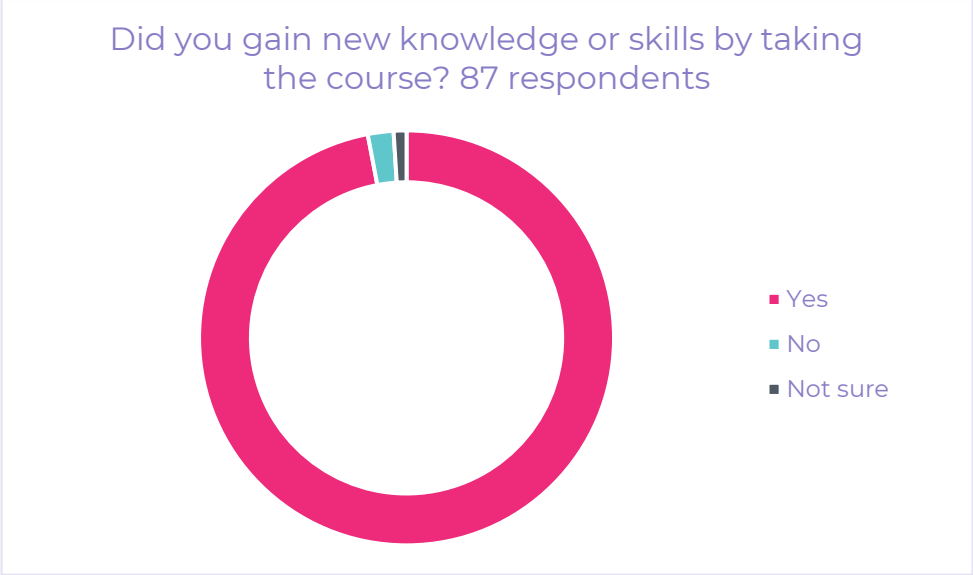

FIGURE 15. COURSE 1 END-OF-COURSE USER FEEDBACK ON GAINED KNOWLEDGE OR SKILLS

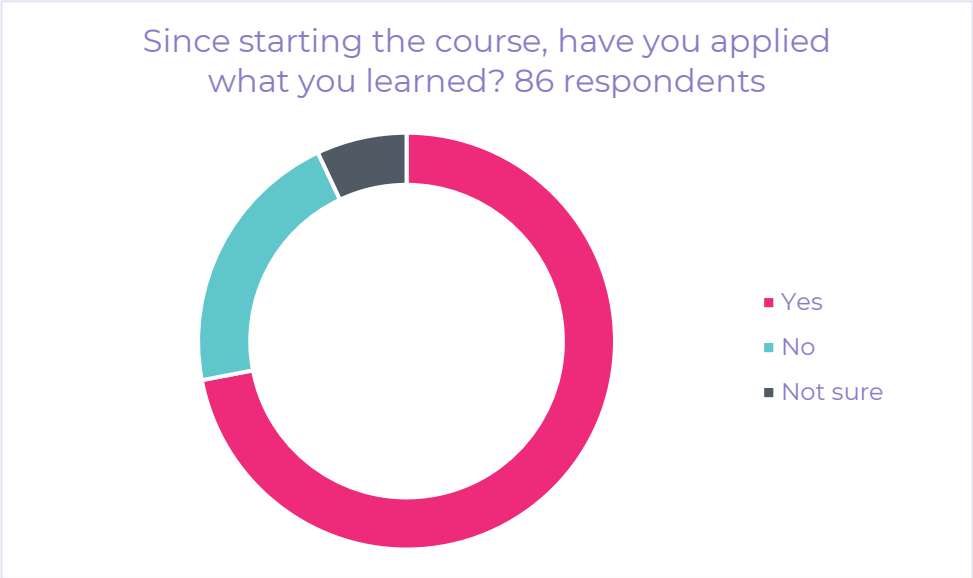

FIGURE 16. COURSE 1 END-OF-COURSE SURVEY ON APPLICATION OF THE NEW KNOWLEDGE BY THE LEARNER

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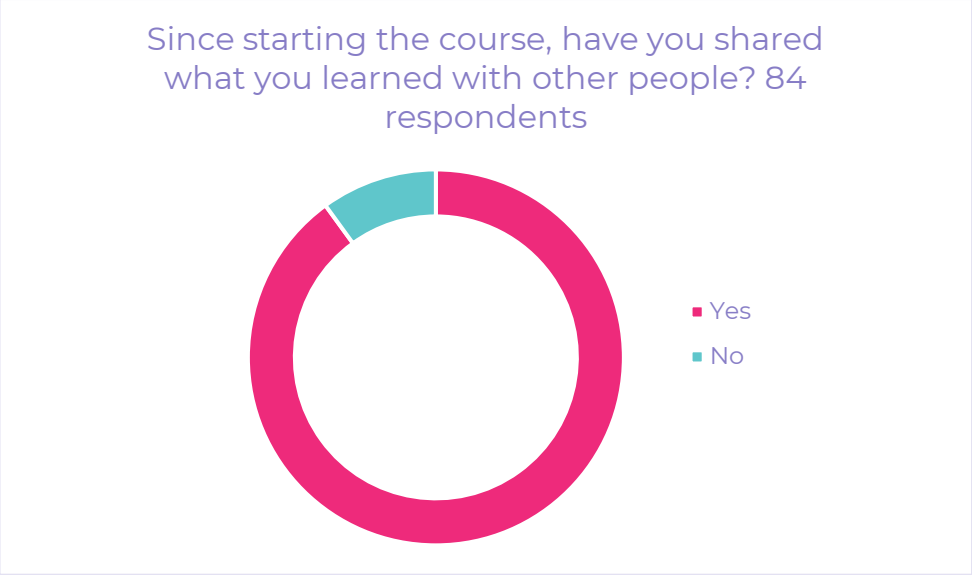

FIGURE 17. COURSE 1 END-OF-COURSE SURVEY ON SHARING THE LEARNINGS BY THE USER

Lessons for future MOOCs

As the entry point to the whole portfolio, Course 1 carries a first-impressions role that the others don't; it generated the highest comment volume of any course (1,229) and, unlike every other course, its introduction step didn't just drive volume but also produced the strongest reply rate of the entire portfolio (21.2%). For future MOOCs, this makes Course 1 a useful reference point for how an entry-level course can be framed to make a strong first impression.

- The introduction step's open, personal and low-barrier framing appears to have been the main driver of its effectiveness, while the later, concept-heavy steps drew high comment volume. The lesson for future MOOCs is that open, personal, low-barrier prompts also work well on content-focused steps, not only on introductions.
- This course surfaces the interests and goals learners state in the introduction step, which indicate the follow-on courses they are most drawn to. For future MOOC portfolios, a closing step that signposts learners toward a relevant follow-on course is a useful way to link courses to one another.
- Course 1 also showed the most evenly distributed participation in the portfolio, with the top 10 commenters accounting for 57.1% of all comments. For future MOOCs, prompts that invite learners to reply to peers who have not yet received a response are a simple way to spread participation more widely.

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COURSE 2: BEYOND THE SHORE: INNOVATING THE BLUE BIOECONOMY ON LAND

Course Summary

Focuses on land-based aquaculture, particularly Recirculating Aquaculture Systems (RAS) — and how it compares with coastal aquaculture. Covers business models and career pathways in the sector, then closes with algae and circular economy applications, from food and animal feed to cosmetics and biofuels (Figure 18).

Learning outcomes

- Evaluate the potential of land-based aquaculture systems in a sustainable Blue Bioeconomy
- Develop innovative business models for land-based aquaculture, focusing on sustainability, profitability, and circularity
- Assess the economic and environmental challenges of land-based aquaculture and strategies to overcome them
- Explore career pathways in land-based aquaculture (technology, sustainability, research)
- Develop an entrepreneurial mindset through critical thinking applied to the sector

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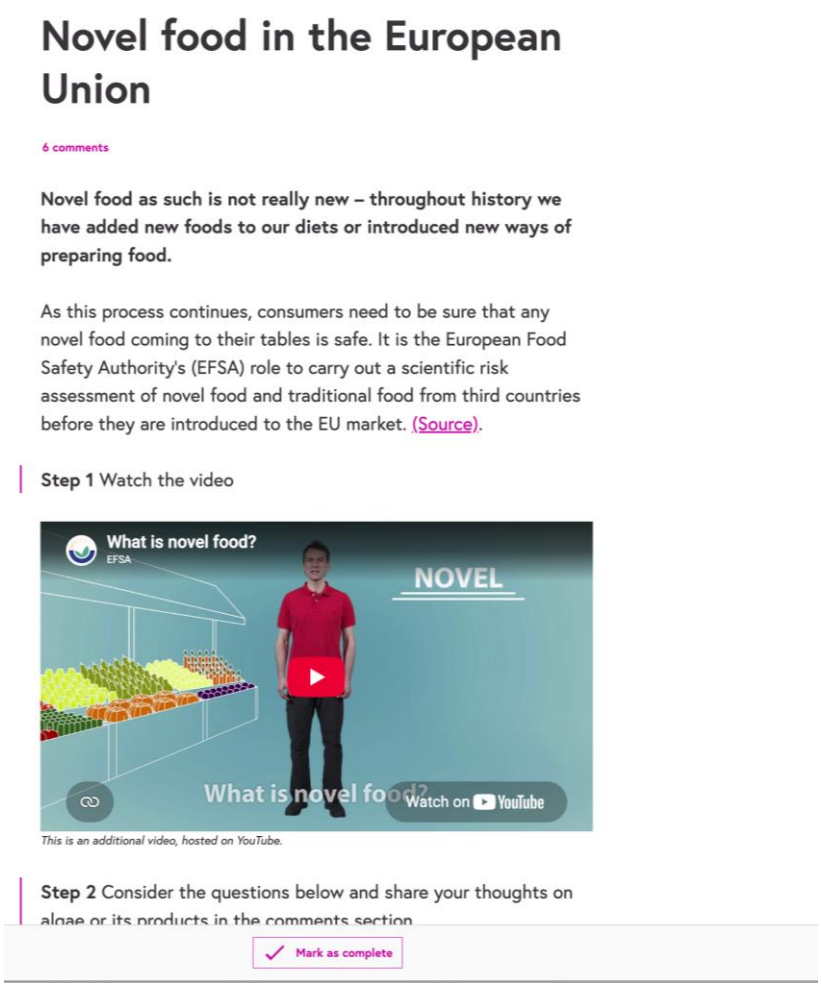

FIGURE 18. COURSE 2 EXAMPLE OF A STEP

Course 2 Statistics

The general statistics for Course 2 are presented in Table 6.

TABLE 6. COURSE 2 GENERAL STATISTICS

Category	Statistics
Joiners	604
Learners	507
Learners with ≥50% step completion	142
Learners with ≥90% step completion	133
Run Retention Index: a measure of how the learner population moves through the entire course. The R-Index is the highest percentage of activated learners who've completed an equivalent portion of the course. e.g., an R-Index of 42.7% means that 42.7% of activated learners completed at least 42.7% of the course.	45.3%

Course 2 Demographics

Course 2 country of residence

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The FutureLearn platform does not force the participants to confirm their country of residence. Learners can indicate their country in their profiles, and FutureLearn also assigns a country to them based on their IP address. With the widespread use of VPN services, the learner's actual location cannot be confirmed indefinitely. According to the available statistics, the learners came from across the globe (Figure 19). The EU countries with the highest representation are listed in Table 7.

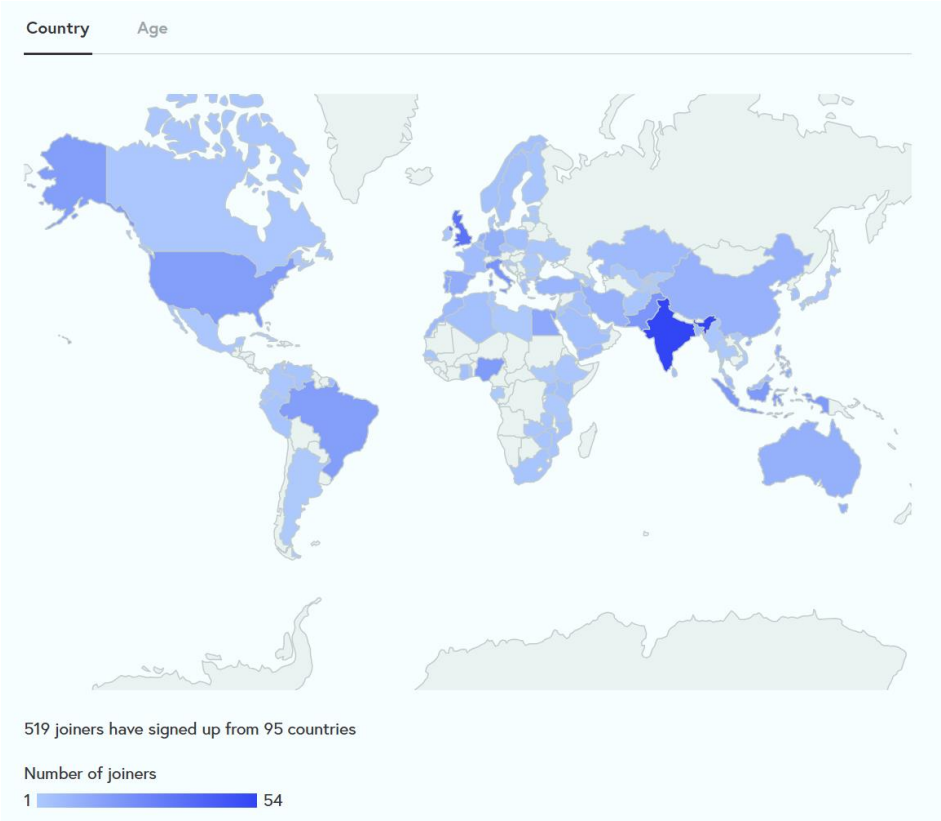

FIGURE 19. COURSE 2 LEARNERS' GLOBAL MAP

TABLE 7. COURSE 2 TOP 10 EUROPEAN COUNTRIES REPRESENTATION

Ranking	Country	Joiners	Active learners
1	United Kingdom	35	16
2	Italy	22	18
3	Portugal	14	5
4	Spain	12	6
5	Germany	11	3
6	Netherlands	11	1
7	France	6	3
8	Poland	5	1
9	Greece	4	2
10	Sweden	4	2

Course 2 learner age

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The majority of learners choose not to share their age on their profiles. The few who shared their ages on their profiles indicate that the 26-35 and 36-45 age groups account for 12% of the age representation among learners for Course 2 (Figure 20).

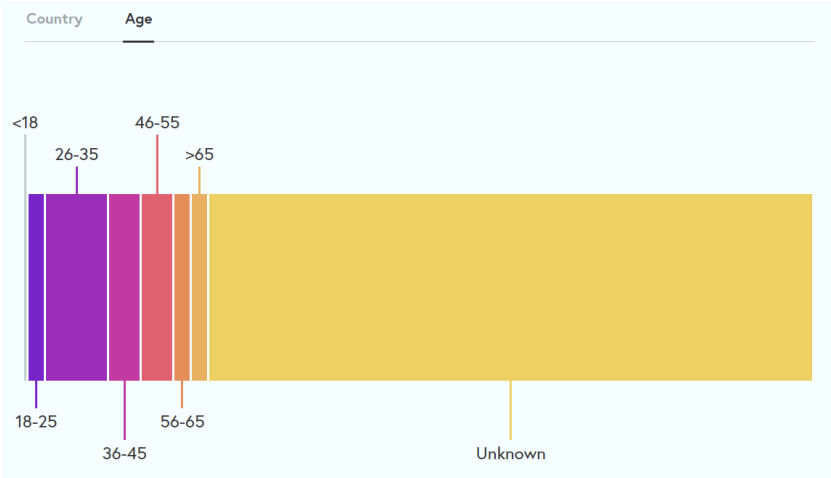

FIGURE 20. COURSE 2 LEARNERS' REPORTED AGE DISTRIBUTION

Learner background

Learners can indicate their background in their profiles – they also have an option to leave it unfilled or choose 'decline-to-answer' options. The course attracted a wide range of learners (Table 8).

TABLE 8. COURSE 2 PARTICIPANTS' BACKGROUND

#	Category	number
0	declined_to_answer	285
0	Unknown	168
1	environment_and_agriculture	37
2	teaching_and_education	34
3	business_consulting_and_management	26
4	science_and_pharmaceuticals	24
5	public_sector	21
6	accountancy_banking_and_finance	17
7	engineering_and_manufacturing	13
8	health_and_social_care	11
9	it_and_information_services	10
10	creative_arts_and_culture	7
11	marketing_advertising_and_pr	7
12	energy_and_utilities	6
13	law	5
14	charities_and_voluntary_work	5
15	hospitality_tourism_and_sport	4
16	armed_forces_and_emergency_services	3
17	media_and_publishing	3
18	retail_and_sales	2

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Course 2 Social Learning Review

Engagement was concentrated early, with the introduction step again the strongest driver of comments. Notably, the best reply rate of the course came not from a content step but from a week-summary reflection point, suggesting natural pause points in the course structure encouraged more exchange than technical content did. Learners engaged particularly well with misconceptions around RAS (Recirculating Aquaculture Systems), often correcting one another unprompted.

"One misconception about RAS is that it is only about compliance... it neglects its broader role in identifying and mitigating risks to improve overall business performance." — **Course 2 learner**

Course 2 End-of-Course Feedback

At the end of the course, learners are asked to provide feedback on their experience via a form, including an opportunity to share a free-text answer. The free-text option was not used by all respondents, and those who did generally focused on gratitude for the course. The same pattern appears across all 5 courses. Learner responses to the end-of-course survey are shown in Figure 21, Figure 22, Figure 23 and Figure 24.

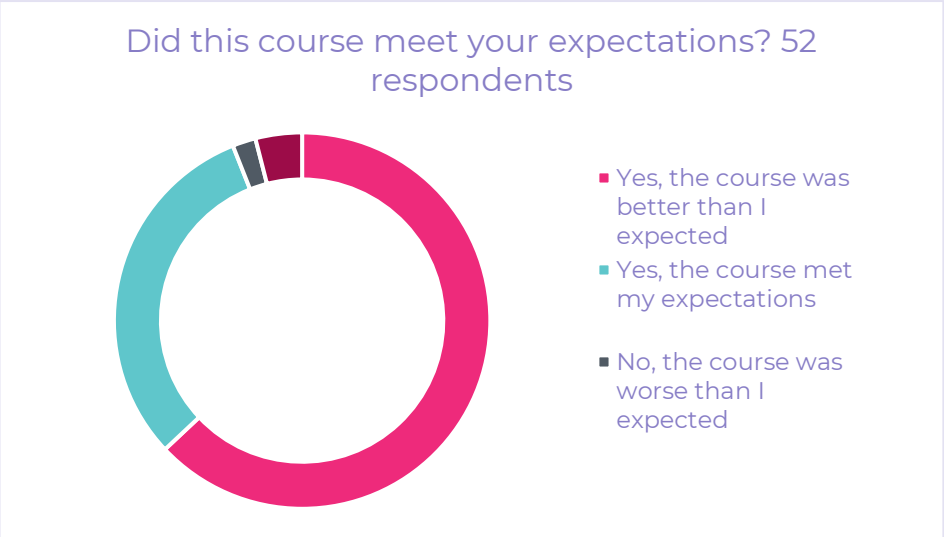

FIGURE 21. COURSE 2 END-OF-COURSE USER SATISFACTION SURVEY

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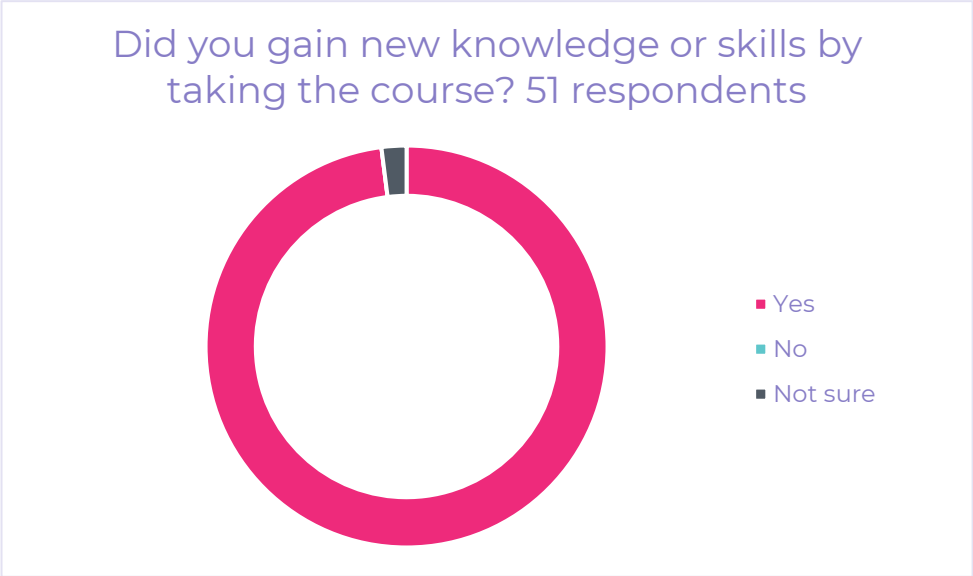

FIGURE 22. COURSE 2 END-OF-COURSE USER FEEDBACK ON GAINED KNOWLEDGE OR SKILLS

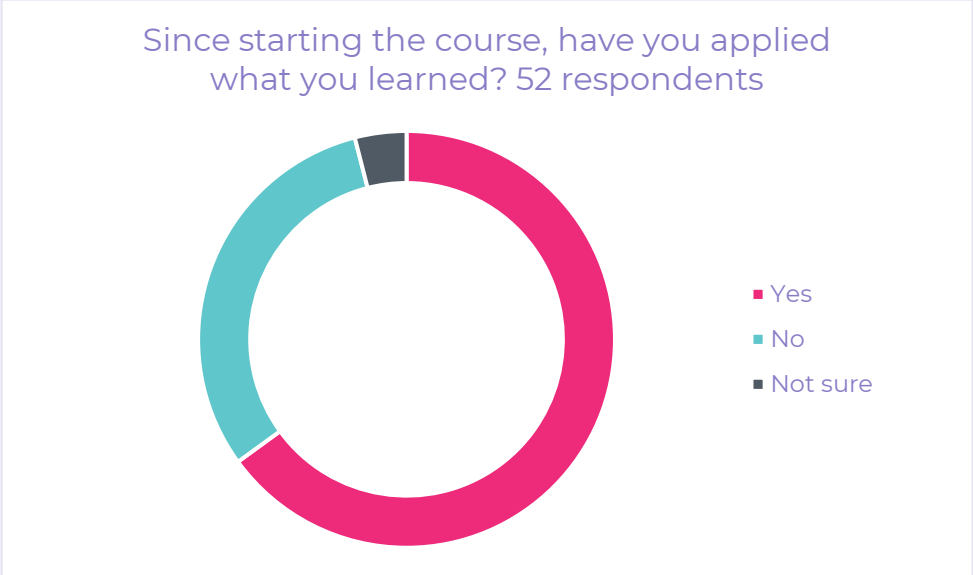

FIGURE 23. COURSE 2 END-OF-COURSE SURVEY ON APPLICATION OF THE NEW KNOWLEDGE BY THE LEARNER

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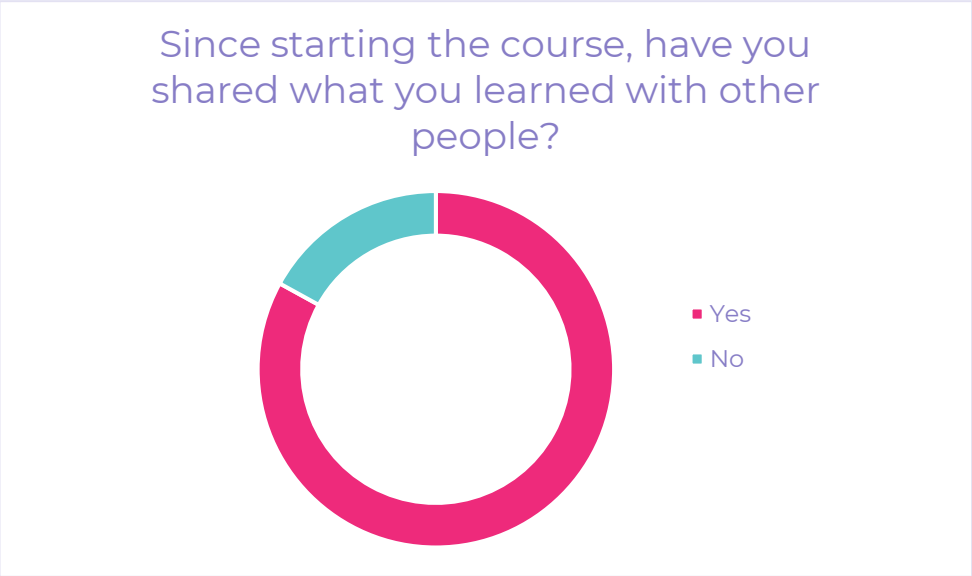

FIGURE 24. COURSE 2 END-OF-COURSE SURVEY ON SHARING THE LEARNINGS BY THE USER

Lessons for future MOOCs

Course 2 stands out because its strongest reply rate came from a structural step rather than from the introduction. For future MOOCs, this points to the role course structure plays in supporting interaction, alongside prompt wording.

- The strongest reply rate in this course came from a week-summary reflection step, not a content step. Short reflection or summary points at the end of each week therefore appear to be an effective structural driver of interaction, and this is one of the clearer structural lessons for future MOOCs: interaction can be designed into the course structure, not only into the wording of prompts.
- Learner comments referenced real company case studies (e.g. Kingfish, Oceanloop, TETRAS) and the discussion around them was consistently substantive. For future MOOCs, real company cases of this kind work well as explicit discussion prompts, since learners engage with them readily.

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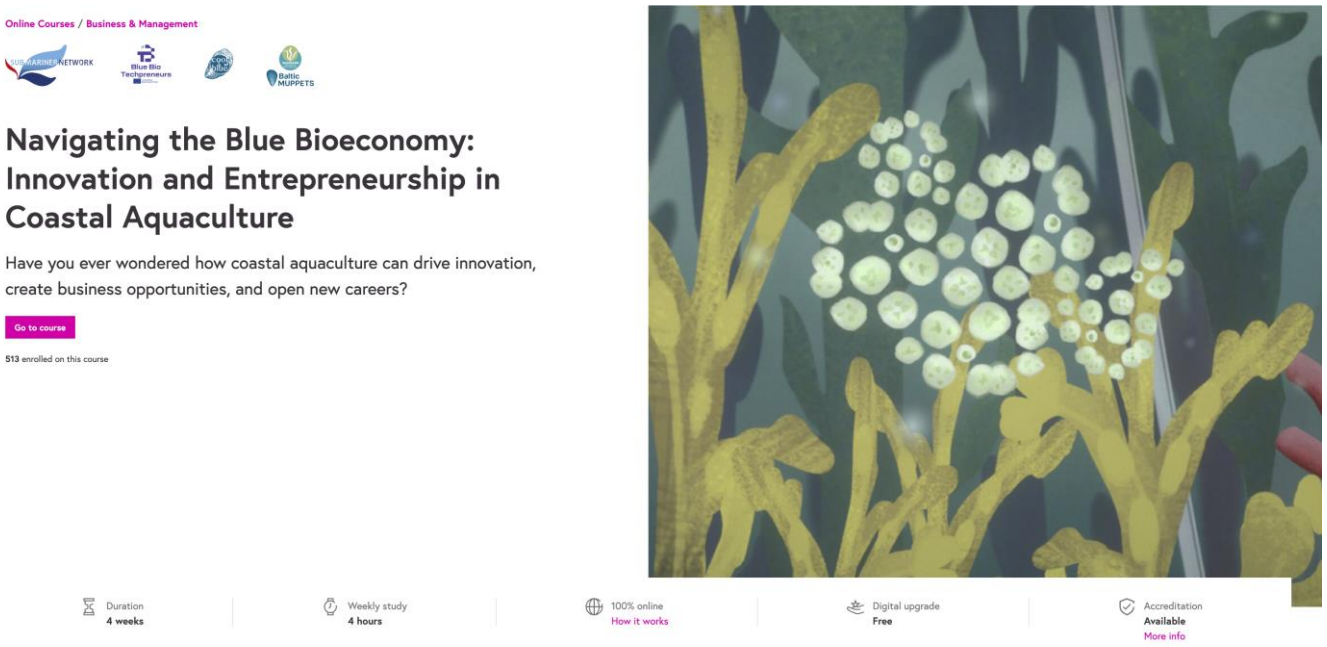
COURSE 3: NAVIGATING THE BLUE BIOECONOMY: INNOVATION AND ENTREPRENEURSHIP IN COASTAL AQUACULTURE

Course Summary



Explores coastal aquaculture as a driver of blue bioeconomy growth, with a strong focus on macroalgae, farming, wild harvest, and applications across food, feed, agriculture, and textiles. Later weeks cover funding, IP, and data management, closing with career pathways in coastal and marine sectors (Figure 25).

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View transcript

Working for a mussel farm

3 comments

Watch the video Ecopelag on summer workers in the factory above to learn what it's like to work on their mussel farm.

Ecopelag is a non-profit organisation founded in 2015 by marine biologists Martin Reutgard and Martin Karlsson. Its mission is to accelerate the recovery of a viable Baltic Sea through innovation and concrete measures, ensuring a sustainable use of its resources.

Women in the blue economy and insights into seaweed entrepreneurship

2 comments

Despite women's significant contributions to the blue economy, they remain underrepresented and undervalued across most sectors. Globally, women make up a small share of the formal workforce in industries such as fisheries, aquaculture, maritime transport, and marine technology.

Step 1: Watch the video section **Q&A about Women in the blue economy**

This is an additional video, hosted on YouTube.

Time code for Q&A about Women in the blue economy: 34:08

FIGURE 25. COURSE 3 EXAMPLE OF A STEP WITH VIDEO CONTENT

Learning outcomes

- Assess the potential of coastal aquaculture and marine biomass-based products
- Develop innovative business models via case studies and industry trend analysis
- Explain environmental, economic, and regulatory challenges/opportunities and their impact on ventures
- Apply business skills (market analysis, strategic planning) to scalable, sustainable businesses
- Evaluate financing options, investment strategies, and legal frameworks for sector growth

Course 3 Statistics

The general statistics for Course 3 are presented in Table 9.

TABLE 9. COURSE 3 GENERAL STATISTICS

Category	Statistics
Joiners	539
Learners	462
Learners with ≥50% step completion	86
Learners with ≥90% step completion	78

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Run Retention Index: a measure of how the learner population moves through the entire course. The R-Index is the highest percentage of activated learners who've completed an equivalent portion of the course. e.g., an R-Index of 42.7% means that 42.7% of activated learners completed at least 42.7% of the course.	35.6%

Course 3 Demographics

Course 3 country of residence

The FutureLearn platform does not force the participants to confirm their country of residence. Learners can indicate their country in their profiles, and FutureLearn also assigns a country to them based on their IP address. With the widespread use of VPN services, the learner's actual location cannot be confirmed indefinitely. According to the available statistics, the learners came from across the globe (Figure 26). The countries with the highest representation are listed in Table 10.

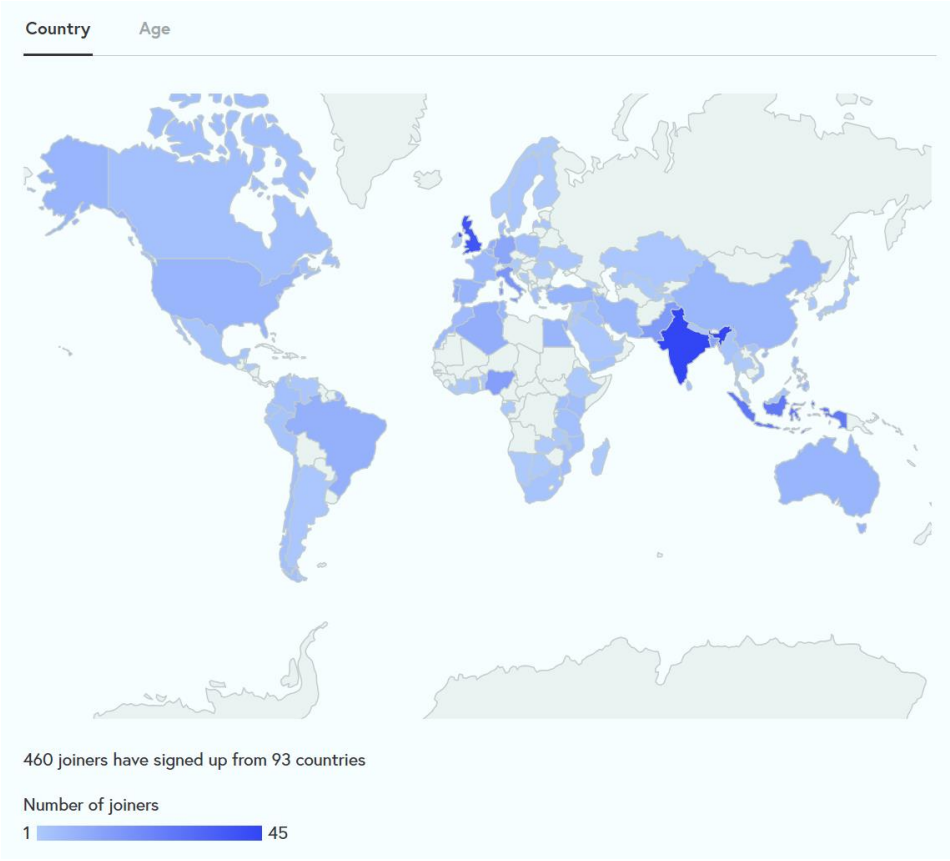

Figure 26. Course 3 learners' global map

Table 10. Course 3 top 10 European countries representation

Ranking	Country	Joiners	Active learners
1	United Kingdom	39	15

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2	Italy	18	12
3	Germany	12	2
4	Portugal	11	4
5	Netherlands	10	5
6	Spain	8	5
7	Belgium	7	2
8	France	6	5
9	Poland	4	0
10	Greece	4	3

Course 3 learner age

The majority of learners choose not to share their age on their profiles. The few who shared their ages on their profiles indicate that the 26-35 and 36-45 age groups account for 12% of the age representation among learners for Course 3 (Figure 27).

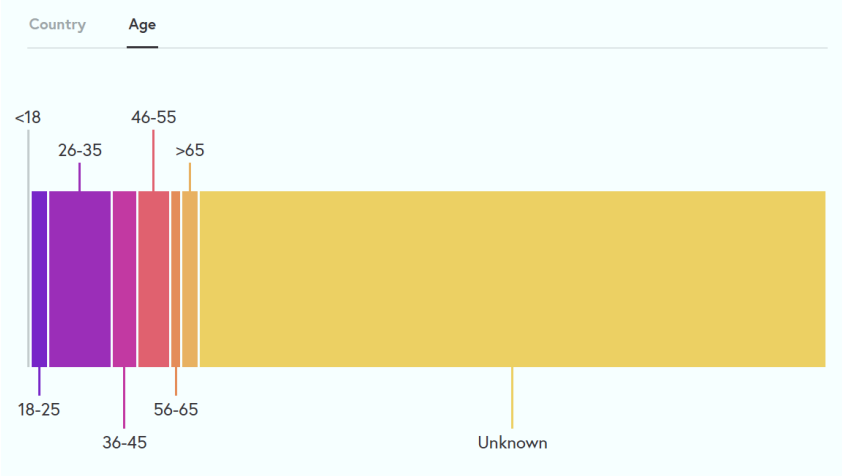

FIGURE 27. COURSE 3 LEARNERS' REPORTED AGE DISTRIBUTION

Learner background

Learners can indicate their background in their profiles – they also have an option to leave it unfilled or choose 'decline-to-answer' options. The course attracted a wide range of learners (Table 11).

TABLE 11. COURSE 3 PARTICIPANTS' BACKGROUND

#	Category	number
0	declined_to_answer	328
0	Unknown	166
1	environment_and_agriculture	43
2	teaching_and_education	24
3	science_and_pharmaceuticals	22
4	business_consulting_and_management	17
5	public_sector	12
6	accountancy_banking_and_finance	11
7	health_and_social_care	8

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8	creative_arts_and_culture	7
9	it_and_information_services	6
10	marketing_advertising_and_pr	6
11	engineering_and_manufacturing	5
12	law	5
13	energy_and_utilities	4
14	charities_and_voluntary_work	2
15	hospitality_tourism_and_sport	2
16	media_and_publishing	2
17	retail_and_sales	2
18	armed_forces_and_emergency_services	1
19	recruitment_and_pr	1

Course 3 Social Learning Review

Course 3 showed the highest concentration of activity in a single learner across the portfolio, with one learner alone responsible for 25.9% of all comments. Unusually, the course overview step, rather than the introduction, generated the strongest reply rate (19.5%). Learner comments reflected strong engagement with macroalgae and regenerative ocean farming as genuinely new ideas.

"The idea of underwater farms really made me think. There isn't one single solution to global food production, but combining different approaches like regenerative ocean farming could make a significant difference." — **Course 3 learner**

Course 3 End-of-Course Feedback

At the end of the course, learners are asked to provide feedback on their experience via a form, including an opportunity to share a free-text answer. The free-text option was not used by all respondents, and those who did generally focused on gratitude for the course. The same pattern appears across all 5 courses. Learner responses to the end-of-course survey are shown in Figure 28, Figure 29, Figure 30 and Figure 31.

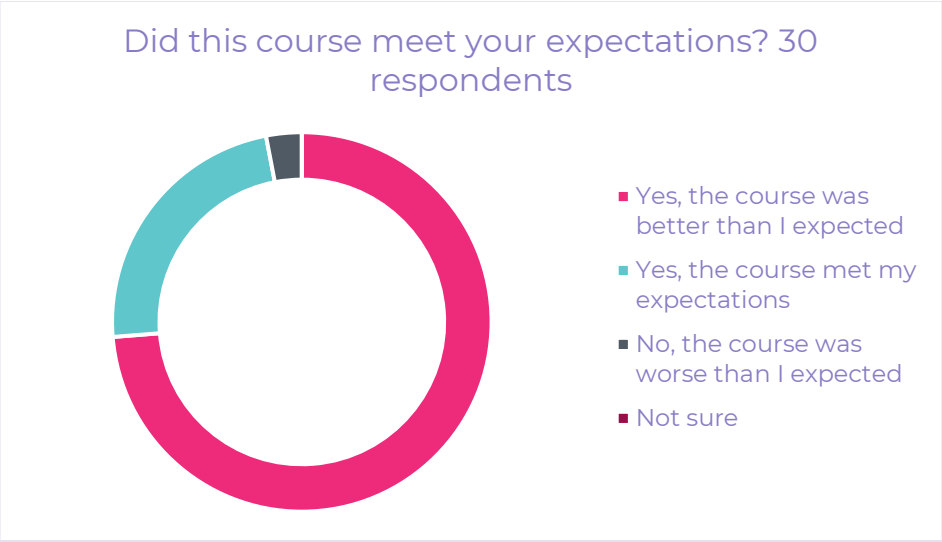

FIGURE 28. COURSE 3 END-OF-COURSE USER SATISFACTION SURVEY

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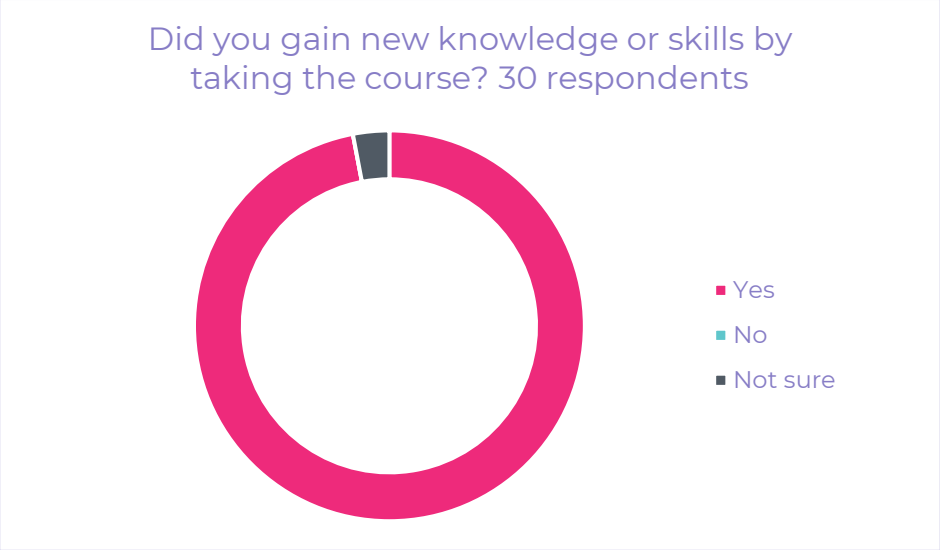

FIGURE 29. COURSE 3 END-OF-COURSE USER FEEDBACK ON GAINED KNOWLEDGE OR SKILLS

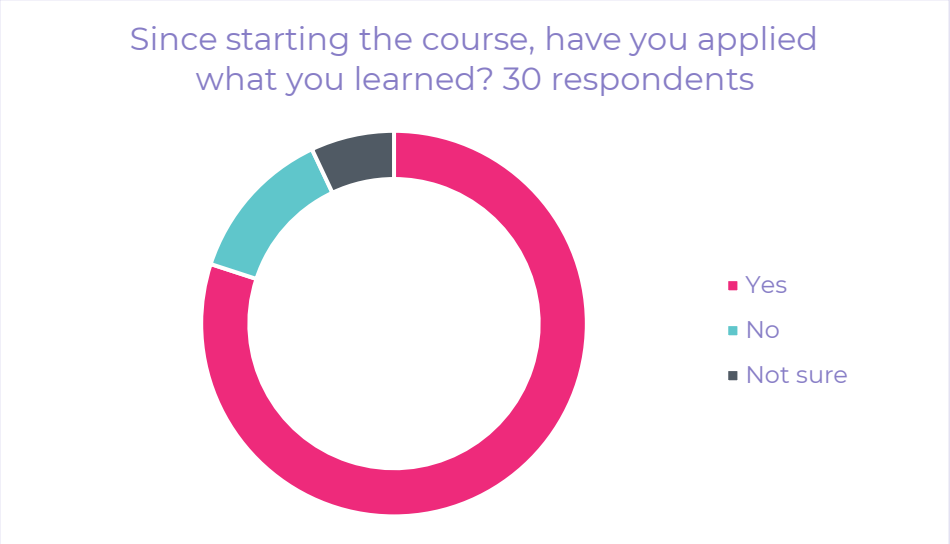

FIGURE 30. COURSE 3 END-OF-COURSE SURVEY ON APPLICATION OF THE NEW KNOWLEDGE BY THE LEARNER

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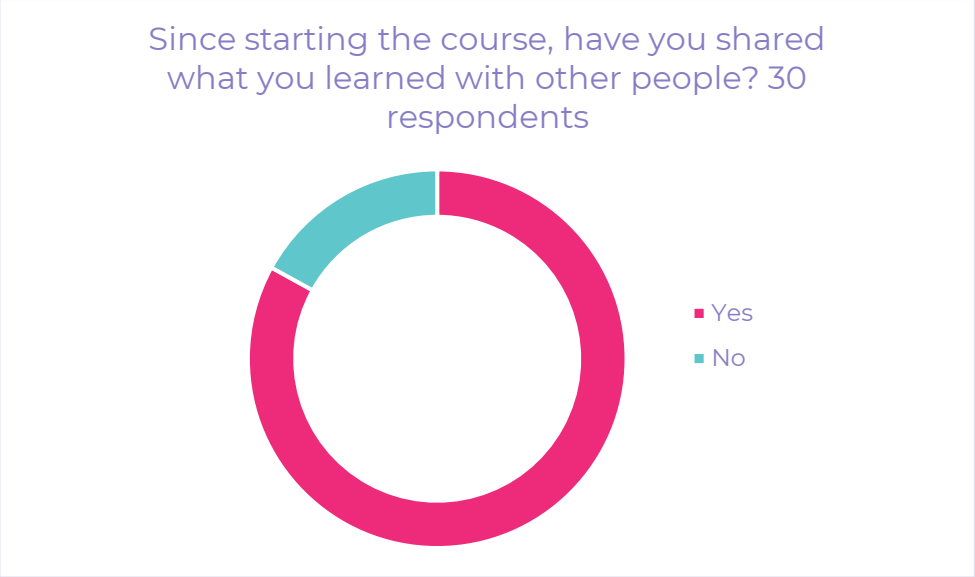

FIGURE 31. COURSE 3 END-OF-COURSE SURVEY ON SHARING THE LEARNINGS BY THE USER

Lessons for future MOOCs

Two findings stand out in Course 3: a high concentration of activity in a highly engaged learner, and a course overview step that, unlike any other course in the portfolio, outperformed the introduction step for replies.

- Activity was concentrated in a small group of learners, with one learner alone producing 25.9% of all comments. The lesson for future MOOCs is that prompts encouraging learners to reply to a wider range of peers help spread participation beyond a small group of very active contributors.
- Unusually, the course overview step outperformed the introduction step for replies (19.5% vs. the introduction's lower rate). The framing of this step therefore appears to have been particularly conducive to reply, and for future MOOCs it offers a useful reference point for how introductory and overview steps can be framed.
- Learner comments show strong, specific engagement with macroalgae and regenerative ocean farming as genuinely new ideas. For future MOOCs, comparison or critique prompts (e.g. “how does this compare to farming methods you're familiar with?”) are an effective way to carry that kind of enthusiasm into peer dialogue.

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COURSE 4: INTEGRATED OCEAN PLANNING: MARINE PROTECTED AREAS, MULTI-USE & BUSINESS PATHWAYS

Course Summary

Connects maritime spatial planning, ocean multi-use, and Marine Protected Areas (MPAs) with business opportunity. Learners examine real pilot cases (e.g. offshore wind co-located with aquaculture), MPA governance and financing, ecosystem services, and career pathways such as MPA manager (Figure 32).

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Business models for Ocean Multi-Use

0 comments

When designing a multi-use venture in the marine or renewable energy space, the choice of business structure should align with the strategic goals, financial resources, and degree of cooperation needed between the industries involved.

What is a business model?

Strategic management tools can be beneficial, especially in the case of ocean MU, to effectively set up or revise a business model and combine different maritime uses. The management tools that can be used in setting up an MU business include the Business Model Canvas and the Lean Canvas. These tools help identify the opportunities for cost reduction and the added value of MU.

FIGURE 32. COURSE 4 EXAMPLE OF AN ARTICLE STEP

Learning outcomes

- Develop foundational knowledge of MPAs, maritime spatial planning (MSP), and ocean multi-use
- Practice analysing real-world MSP/multi-use cases for effective ocean space management
- Explore the role of MPAs in regional/global strategies, assessing ecological and socio-economic effectiveness
- Evaluate business tools and planning strategies (ecosystem service valuation, blended finance) for viable MPA management
- Identify MPA manager responsibilities and career pathways via simulations and roleplay

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Course 4 Statistics

The general statistics for Course 4 are presented in Table 12.

TABLE 12. COURSE 4 GENERAL STATISTICS

Category	Statistics
Joiners	513
Learners	278
Learners with ≥50% step completion	127
Learners with ≥90% step completion	122
Run Retention Index: a measure of how the learner population moves through the entire course. The R-Index is the highest percentage of activated learners who've completed an equivalent portion of the course. e.g., an R-Index of 42.7% means that 42.7% of activated learners completed at least 42.7% of the course.	45%

Course 4 Demographics

Course 4 country of residence

The FutureLearn platform does not force the participants to confirm their country of residence. Learners can indicate their country in their profiles, and FutureLearn also assigns a country to them based on their IP address. With the widespread use of VPN services, the learner's actual location cannot be confirmed indefinitely. According to the available statistics, the learners came from across the globe (Figure 33). The countries with the highest representation are listed in Table 13.

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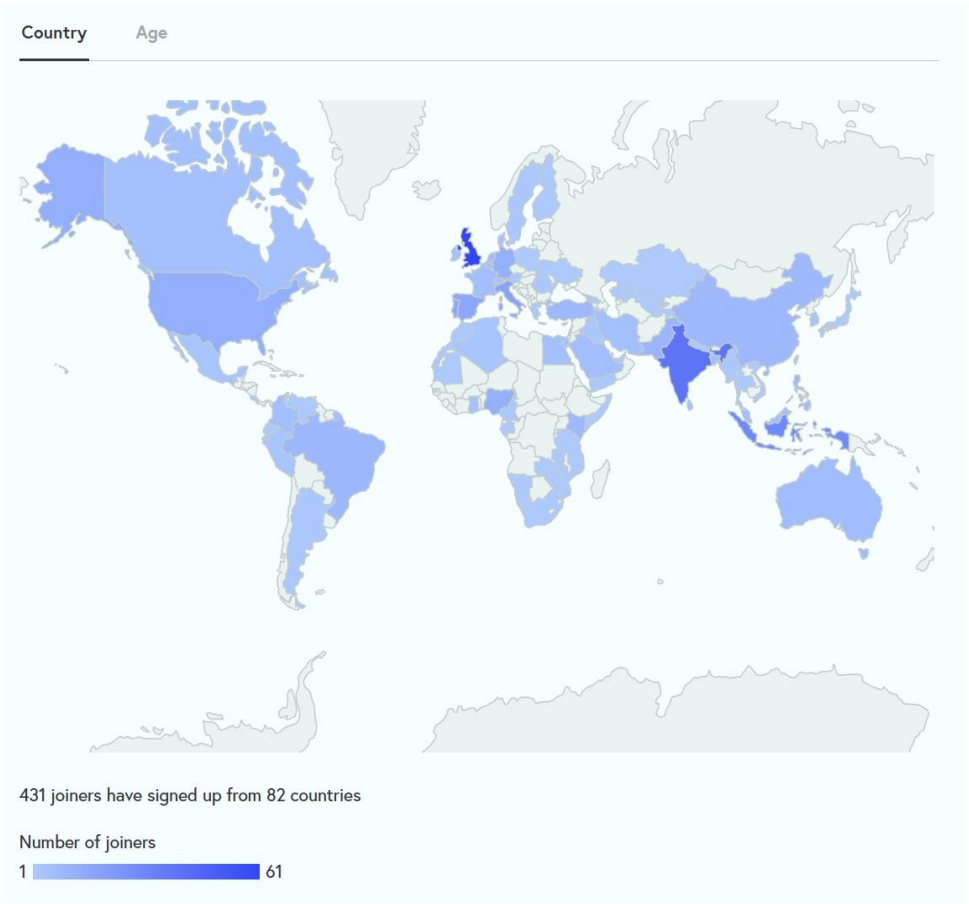

FIGURE 33. COURSE 4 LEARNERS' GLOBAL MAP

TABLE 13. COURSE 4 TOP 10 EUROPEAN COUNTRIES REPRESENTATION

Ranking	Country	Joiners	Active learners
1	United Kingdom	61	22
2	Italy	18	14
3	Portugal	16	6
4	Spain	16	12
5	Germany	12	4
6	France	6	3
7	Netherlands	6	3
8	Belgium	5	2
9	Denmark	4	3
10	Ireland	4	3

Course 4 learner age

The majority of learners choose not to share their age on their profiles. The few who shared their ages on their profiles indicate that the 26-35 and 36-45 age groups account for 10% of the age representation among learners for Course 4 (Figure 34).

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FIGURE 34. COURSE 4 LEARNERS' REPORTED AGE DISTRIBUTION

Learner background

Learners can indicate their background in their profiles – they also have an option to leave it unfilled or choose 'decline-to-answer' options. The course attracted a wide range of learners (Table 14).

TABLE 14. COURSE 4 PARTICIPANTS' BACKGROUND

#	Category	number
0	declined_to_answer	196
0	Unknown	118
1	environment_and_agriculture	35
2	business_consulting_and_management	21
3	teaching_and_education	17
4	engineering_and_manufacturing	15
5	science_and_pharmaceuticals	12
6	health_and_social_care	9
7	public_sector	9
8	law	8
9	creative_arts_and_culture	6
10	charities_and_voluntary_work	6
11	energy_and_utilities	5
12	accountancy_banking_and_finance	4
13	it_and_information_services	4
14	marketing_advertising_and_pr	4
15	hospitality_tourism_and_sport	2
16	media_and_publishing	2
17	retail_and_sales	1
18	armed_forces_and_emergency_services	1
19	recruitment_and_pr	1

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Course 4 Social Learning Review

Course 4 had a lower reply rate than the first four courses. Interestingly, its best-performing steps for replies were two Maritime Spatial Planning content steps rather than the introduction; technical content occasionally outperformed onboarding prompts here.

"I think one of the main challenges to achieving the 30x30 goals is ensuring effective management and enforcement of MPAs, not just expanding them." — **Course 4 learner**

Course 4 End-of-Course Feedback

At the end of the course, learners are asked to provide feedback on their experience via a form, including an opportunity to share a free-text answer. The free-text option was not used by all respondents, and those who did generally focused on gratitude for the course. The same pattern appears across all 5 courses. Learner responses to the end-of-course survey are shown in Figure 35, Figure 36, Figure 37 and Figure 38.

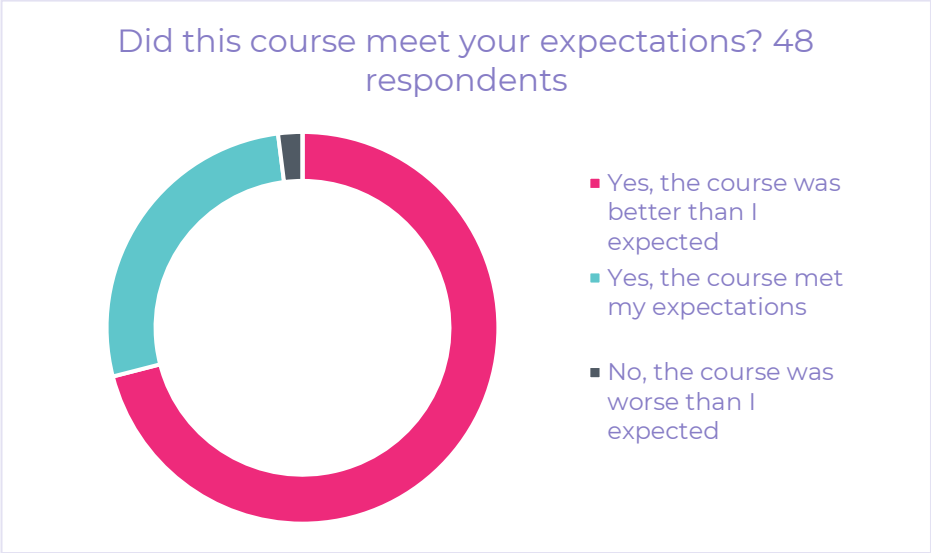

FIGURE 35. COURSE 4 END-OF-COURSE USER SATISFACTION SURVEY

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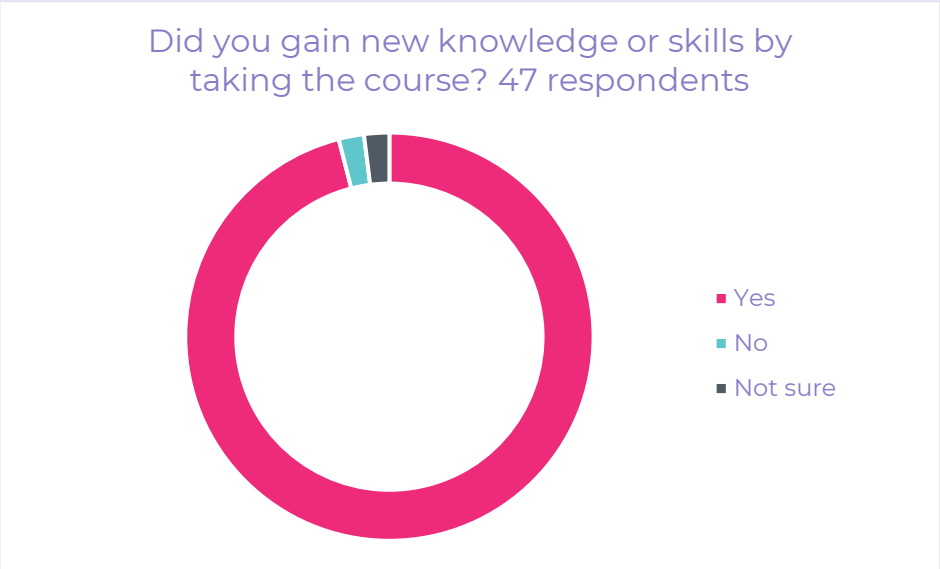

FIGURE 36. COURSE 4 END-OF-COURSE USER FEEDBACK ON GAINED KNOWLEDGE OR SKILLS

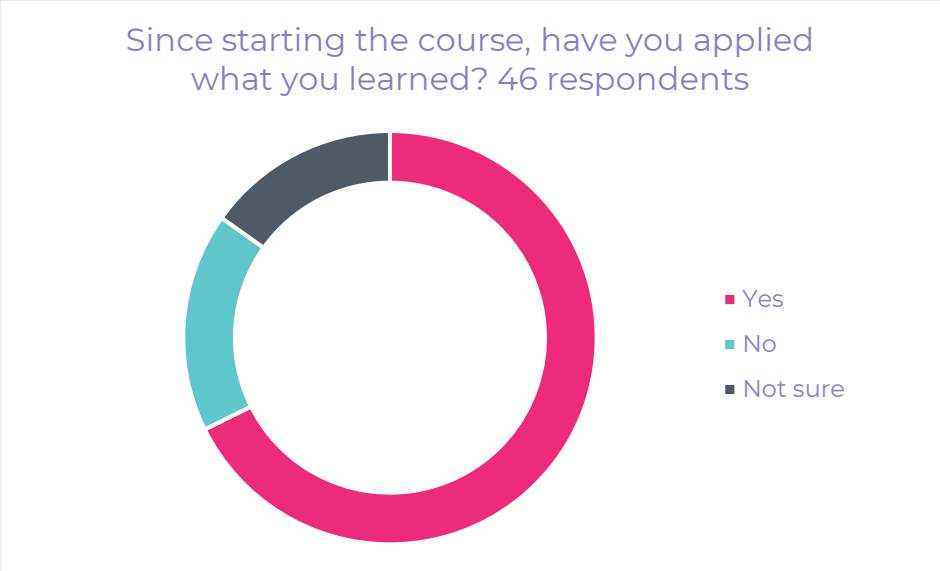

FIGURE 37. COURSE 4 END-OF-COURSE SURVEY ON APPLICATION OF THE NEW KNOWLEDGE BY THE LEARNER

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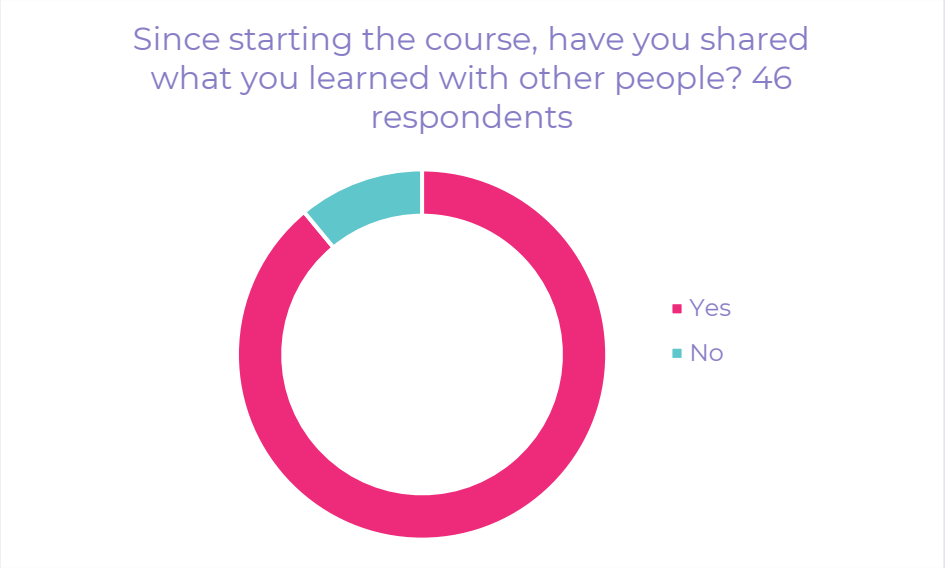

FIGURE 38. COURSE 4 END-OF-COURSE SURVEY ON SHARING THE LEARNINGS BY THE USER

Lessons for future MOOCs

Course 4 is the only course in the portfolio where technical content steps outperformed the introduction step for replies, and it's also the only course where direct, unprompted accessibility feedback appeared in the comments.

- Two Maritime Spatial Planning content steps outperformed the introduction step for replies (10–20% vs. a lower rate on the introduction), the opposite pattern to every other course in the portfolio. What made these steps distinctive was most likely their more concrete, debatable and opinion-inviting claims, such as MPA effectiveness or the “paper parks” problem, a framing that works well for content steps of this kind in future MOOCs.
- Ecosystem-service valuation and MPA financing mechanisms attracted recurring learner questions. This course sits at a genuine intersection of conservation and business logic, and the lesson for future MOOCs is that topics at this kind of intersection would benefit from a short explainer or worked example.
- This course attracted a distinct, more specialist audience whose engagement patterns differ from the rest of the portfolio. For future MOOCs, specialist topics of this kind appear well suited to formats that combine the online course with live workshops.

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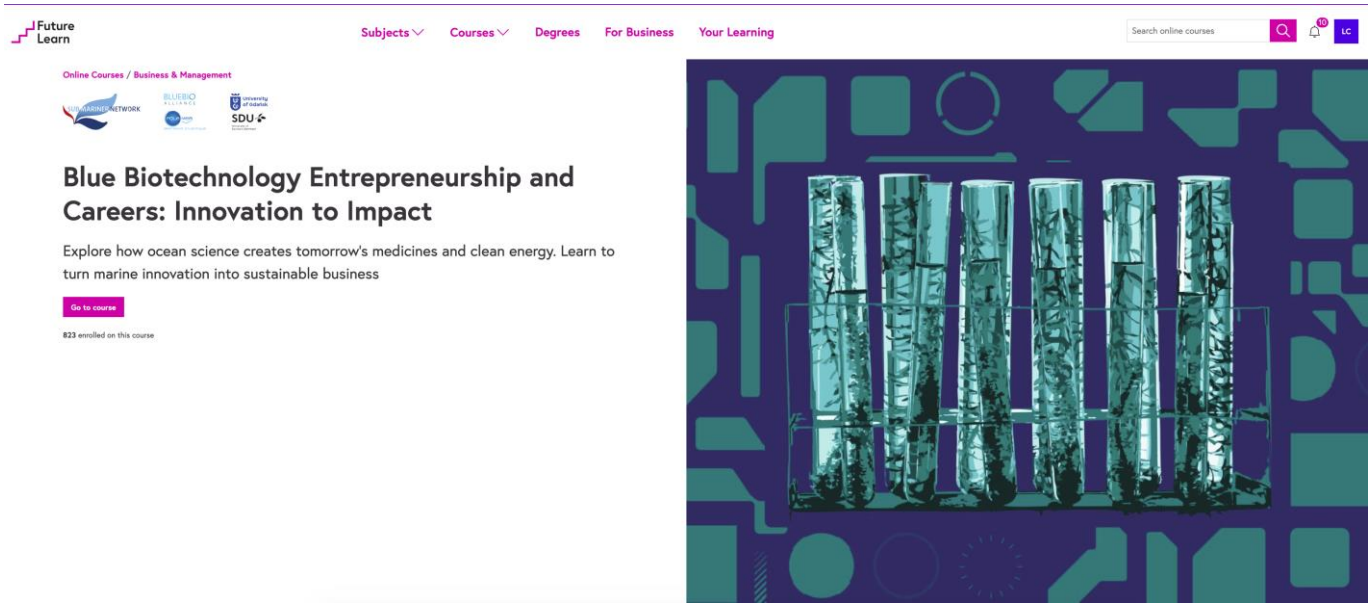
COURSE 5: BLUE BIOTECHNOLOGY ENTREPRENEURSHIP AND CAREERS: INNOVATION TO IMPACT

Course Summary



The most specialised and longest course in the portfolio. Covers the science of marine biotechnology (key organisms, bioprospecting, bioremediation, bioenergy) alongside the business skills to commercialise it, IP strategy, funding and investment, and building a blue biotech venture, closing with a dedicated focus on skills, leadership, and industry-academia collaboration (Figure 39).

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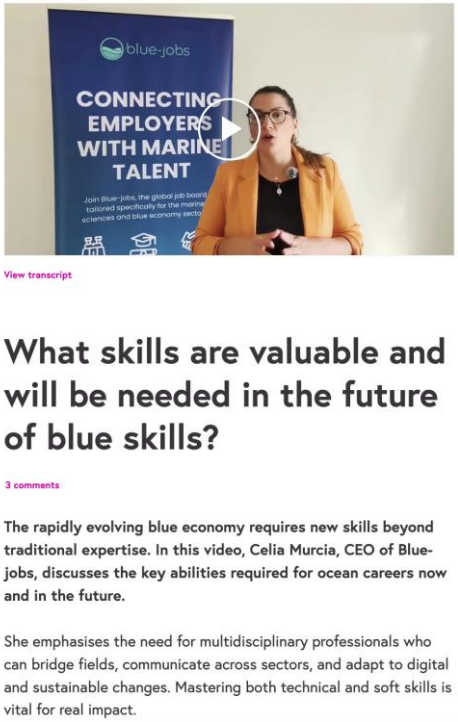

FIGURE 39. COURSE 5 EXAMPLE OF A STEP WITH VIDEO CONTENT

Learning outcomes

- Develop knowledge of blue biotechnology, key organisms, and applications in emerging industries
- Explore market dynamics, commercialisation pathways, and market research for startups
- Investigate key technological processes (bioremediation, bioprospecting, biorefineries)
- Evaluate product innovation, sustainable solutions, and the role of IP in protecting new ideas
- Perform entrepreneurship skills — business cases, models, financing, operations, growth strategies
- Explore career development — technical/soft skills, leadership, industry-academia collaboration

Course 5 Statistics

The general statistics for Course 5 are presented in Table 15.

TABLE 15. COURSE 5 GENERAL STATISTICS

Category	Statistics
Joiners	853
Learners	763
Learners with ≥50% step completion	213
Learners with ≥90% step completion	194
Run Retention Index: a measure of how the learner population moves through the entire course. The R-Index is the highest percentage of activated learners who've completed an equivalent portion of the course. e.g., an R-Index of 42.7% means that 42.7% of activated learners completed at least 42.7% of the course.	44.6%

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Course 5 Demographics

Course 5 country of residence

The FutureLearn platform does not force the participants to confirm their country of residence. Learners can indicate their country in their profiles, and FutureLearn also assigns a country to them based on their IP address. With the widespread use of VPN services, the learner's actual location cannot be confirmed indefinitely. According to the available statistics, the learners came from across the globe (Figure 40). The countries with the highest representation are listed in Table 16.

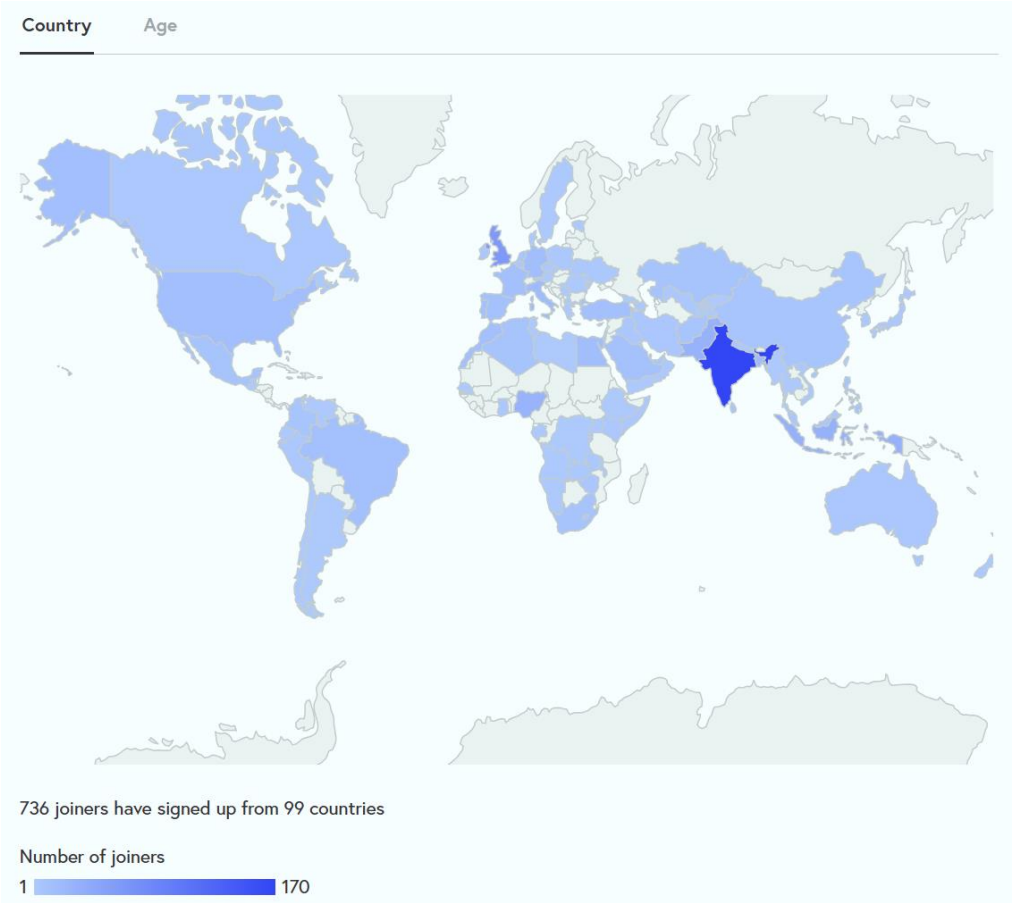

FIGURE 40. COURSE 5 LEARNERS' GLOBAL MAP

TABLE 16. COURSE 5 TOP 10 EUROPEAN COUNTRIES REPRESENTATION

Ranking	Country	Joiners	Active learners
1	United Kingdom	62	32
2	Italy	18	11
3	Germany	16	6
4	Portugal	14	6
5	France	12	3
6	Spain	11	5
7	Netherlands	7	4
8	Ireland	4	3

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9	Ukraine	4	3
10	Poland	3	2

Course 5 learner age

The majority of learners choose not to share their age on their profiles. The few who shared their ages on their profiles indicate that the 26-35 and 36-45 age groups account for 6% of the age representation among learners for Course 5 (Figure 41).

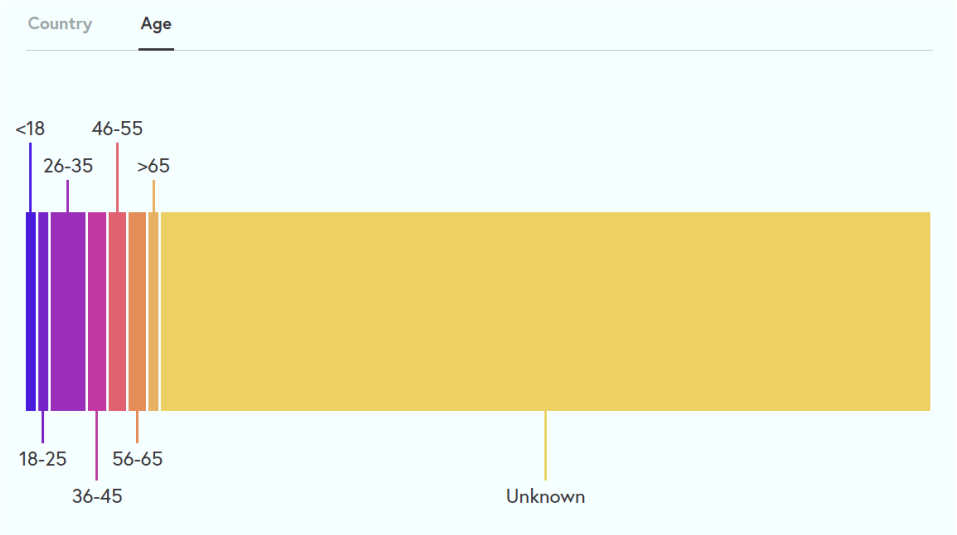

FIGURE 41. COURSE 5 LEARNERS' REPORTED AGE DISTRIBUTION

Learner background

Learners can indicate their background in their profiles – they also have an option to leave it unfilled or choose 'decline-to-answer' options. The course attracted a wide range of learners (Table 17).

TABLE 17. COURSE 5 PARTICIPANTS' BACKGROUND

#	Category	number
0	declined_to_answer	320
0	Unknown	187
1	science_and_pharmaceuticals	61
2	teaching_and_education	38
3	environment_and_agriculture	29
4	business_consulting_and_management	26
5	health_and_social_care	26
6	engineering_and_manufacturing	20
7	it_and_information_services	19
8	accountancy_banking_and_finance	16
9	public_sector	12
10	marketing_advertising_and_pr	8
11	hospitality_tourism_and_sport	6

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12	creative_arts_and_culture	5
13	law	4
14	retail_and_sales	4
15	armed_forces_and_emergency_services	4
16	charities_and_voluntary_work	3
17	energy_and_utilities	3
18	media_and_publishing	2
19	recruitment_and_pr	1

Course 5 Social Learning Review

Course 5 recorded the highest comment volume of any course after Course 1, with engagement taking the form of individual contributions rather than peer exchange: 643 comments at a reply rate of 0.2%. The introduction step alone drew 55 comments from 54 unique commenters. Academic and research interest was the strongest stated learner motivation for this course, ahead of general topic curiosity, and learner comments frequently connected course content to specific career and study ambitions.

"This course was an extremely valuable and inspiring experience for me. From gaining a strong foundation in marine biotechnology to developing a deeper understanding of entrepreneurship, sustainability, and leadership in the blue bioeconomy, the content was well-structured, practical, and highly relevant." — **Course 5 learner, end-of-course reflection**

Course 5 End-of-Course Feedback

At the end of the course, learners are asked to provide feedback on their experience via a form, including an opportunity to share a free-text answer. The free-text option was not used by all respondents, and those who did generally focused on gratitude for the course. The same pattern appears across all 5 courses. Learner responses to the end-of-course survey are shown in Figure 42, Figure 43, Figure 44 and Figure 45.

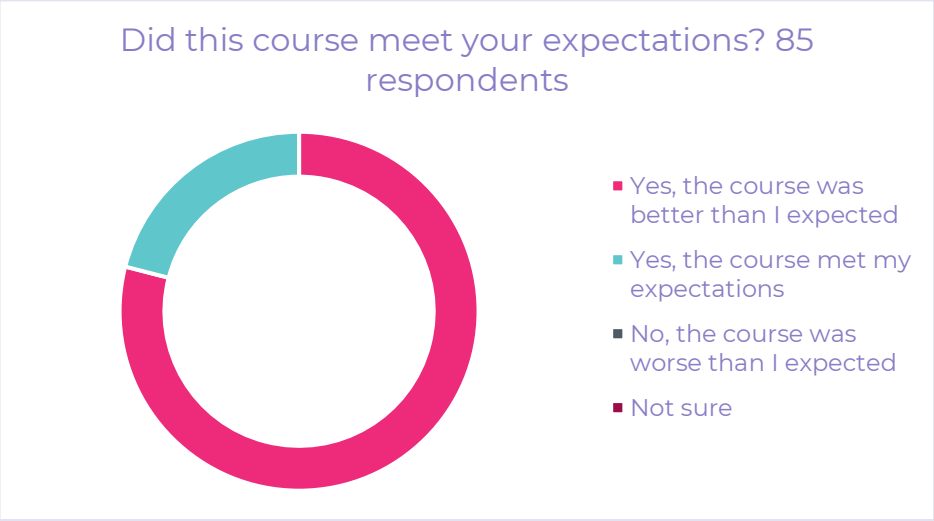

FIGURE 42. COURSE 5 END-OF-COURSE USER SATISFACTION SURVEY

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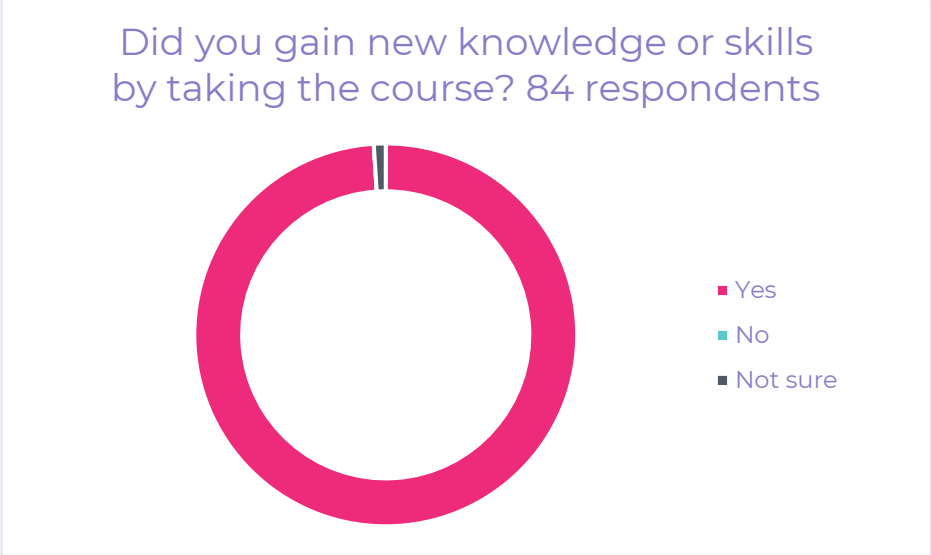

FIGURE 43. COURSE 5 END-OF-COURSE USER FEEDBACK ON GAINED KNOWLEDGE OR SKILLS

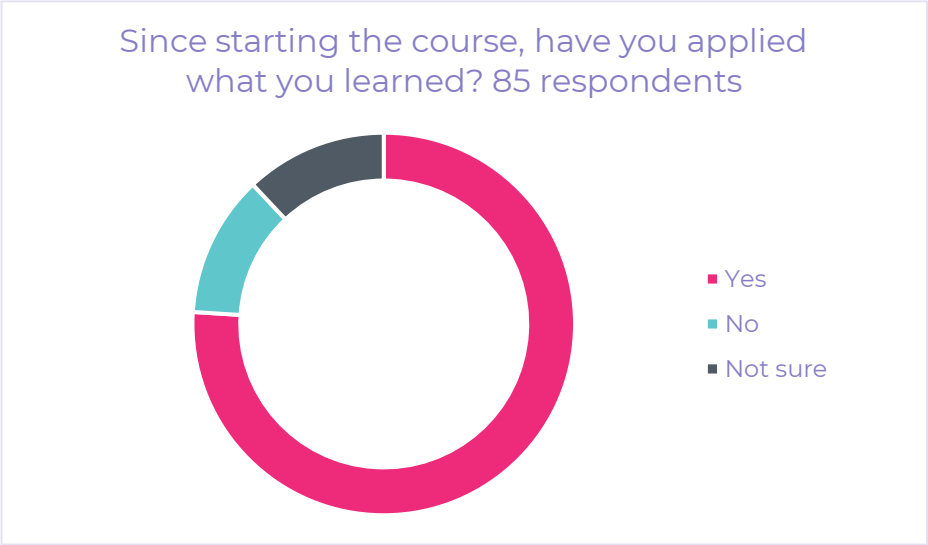

FIGURE 44. COURSE 5 END-OF-COURSE SURVEY ON APPLICATION OF THE NEW KNOWLEDGE BY THE LEARNER

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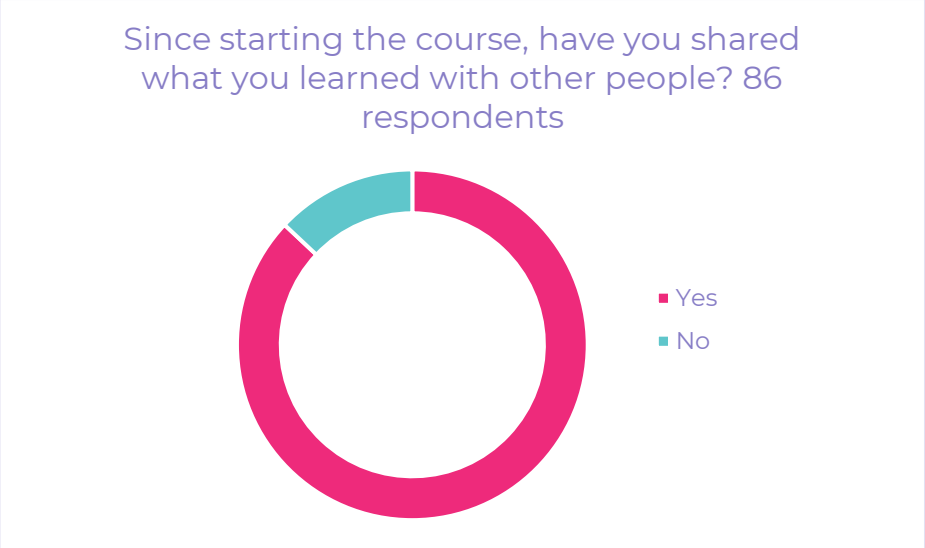

FIGURE 45. COURSE 5 END-OF-COURSE SURVEY ON SHARING THE LEARNINGS BY THE USER

Lessons for future MOOCs

Course 5 stands out for its strong comment volume (643, second only to Course 1), indicating genuine learner interest and engagement with the material. Most of that engagement took the form of individual contributions rather than peer exchange. This course is also more oriented toward careers and personal pathways than the others, with a comparatively lighter focus on subject-matter debate. Learners may naturally be more focused on individual reflection about their own next steps than on discussing the content itself, which is worth keeping in mind when interpreting the engagement figures for this course.

- Engagement in this course took the form of individual contributions rather than peer exchange, with strong participation at the most active steps, including the introduction step (55 comments, 54 commenters). For future MOOCs, light-touch facilitation, a facilitator modelling a handful of replies, is a low-cost way to encourage peer exchange alongside individual contributions.
- Bioprospecting ethics, IP strategy, life-cycle assessment and investor due diligence were the topics that generated the most learner questions, reflecting this course's more technical and commercial content. For future MOOCs, topics of this kind would benefit from additional clarifying content.
- Academic/research interest was the strongest stated learner motivation for this course, ahead of general topic curiosity. For future MOOCs with a strongly academic audience, a short "where this leads" step linking content to further study and research pathways speaks directly to this motivation, and this audience may respond well to structured peer-review-style tasks (e.g. critique a peer's business case) alongside the more open prompts used elsewhere in the portfolio.

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