NBS EduWORLD

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Nature-Based Solutions Education Network (NBS EduWORLD)

Piloting and Assessment of Stepping Stones and Education Journeys

Deliverable D4.2

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Abstract	This work builds on earlier efforts in architecture and the evaluation of Nature-based Solutions (NBS) in education to advance institutional leadership through capacity-building initiatives. A comprehensive set of innovative guidance materials are developed, which aim at embedding NBS thinking within strategic and operational practices across higher education and industry. Central to this effort is the co-creation and delivery of interactive workshops designed to establish baseline knowledge, stimulate peer learning, and facilitate knowledge exchange among partners and stakeholders. As a key output, the project involved the design, testing and implementation of **50 modular Learning Units**, structured to support both formal accreditation and informal learning. These units cover foundational to advanced concepts and are mapped as 'stepping stones' within a sequential learning framework. The resulting output of this report offers a scalable, adaptable resource to embed NBS literacy into educational ecosystems and workforce development strategies along with exploring the stepping stones of education journeys involving NBS.
Keywords	NBS, Higher Education, Learning Units
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Acronyms

BVC	Big Van Ciencia
EC	European Commission
ECTS	European Credit Transfer System
EQF	European Qualifications Framework
ERA	European Research Area
EU	European Union
LU	Learning Unit
NBS	Nature-based Solutions
NBE	Nature-based Enterprise
NFQ	National Framework of Qualifications (Ireland)
OCC	Offaly County Council
QF- EHEA	Qualifications Framework – European Higher Education Area
PPMI	Public Policy and Management Institute
TCD	Trinity College Dublin
ROF	Regenerative Ocean Farming
SDGs	Sustainable Development Goals

Executive Summary

This report documents the piloting and dissemination of Learning Units (LUs) created under the NBS EduWORLD project to advance Nature-based Solutions (NBS) education across multiple learning contexts. The work aimed to produce high-quality, openly accessible educational resources that can be integrated into formal, non-formal, and informal Higher, professional, community and vocational education settings to build NBS knowledge, skills, and awareness.

The report summarises the design principles of the LUs, which follow an outcomes-based pedagogy and are standardised as 50-minute modules. They are tailored to specific education levels, including vocational/professional training, higher education, and entrepreneurship education, and can be adapted for self-directed learning or clustered for workshops and short courses. All resources are licensed under Creative Commons (CC BY 4.0) to maximise accessibility and reusability.

Pilot testing then took place across a range of settings, including higher education institutions, vocational training programmes, professional capacity-building workshops, and entrepreneurship initiatives. Feedback indicated strong adaptability, relevance, and potential for integration into existing curricula, professional development programmes, and community adult education initiatives.

The report also documents strategic dissemination activities, including engagement with European and international higher education networks, professional associations, and community organisations. Early promotion through the NetworkNature Task Force on NBS Education demonstrated the potential reach to educators, researchers, and practitioners across Europe and beyond.

Looking ahead, the report highlights opportunities to embed LUs into mainstream education and professional training pathways, develop micro-credentials, and leverage the growing institutional and industry focus on sustainability. Plans for long-term hosting of the resources on recognised European platforms, such as Oppla and Scientix® to support sustained access, have been mentioned.

Overall, the LUs represent a significant step towards building a shared foundation for NBS education, offering adaptable and accessible tools for a diverse range of learners and educators, and creating momentum for the broader mainstreaming of NBS concepts and practices.

1. Introduction

According to the European Commission, Nature-based Solutions (NBS) are "…solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience" (European Commission, 2021). Recently, the recognition of the value of NBS is being integrated into government and organisational strategies for climate adaptation and to enhance biodiversity. However, conventional 'grey solutions' over NBS 'green solutions' remain a common choice in addressing key environmental planning decisions. This reinforces the importance of enhancing NBS education. Building the knowledge, skills and competences on NBS in public parlance, but also with key decision-makers means there can be informed choices to support and realise NBS in urban, rural and coastal communities (Goodwin et al., 2024).

This Horizon Europe project NBS EduWORLD, intersects NBS with education, offering a platform to create educational opportunities for researchers, educators, professionals, entrepreneurs, practitioners and community members. NBS EduWORLD's goal is to mainstream NBS education across formal, non-formal and informal adult educational settings. The purpose of this NBS education is to build awareness, knowledge and understanding of the value and the potential of the role of nature to solve social, environmental and economic challenges in communities.

Through NBS EduWORLD, Mulvik et al. (2023) reviewed the state of NBS education across Europe, demonstrating the potential for NBS, but also showing the considerable dearth of NBS integration in formal education programmes and in informal and non-formal adult learning spaces. This gap presented an opportunity for NBS EduWORLD to build higher education and entrepreneurship architecture for learning programmes that could be integrated into higher, vocational, and entrepreneurship education along with educational opportunities in professional and practitioner settings (Dowling et al., 2025). NBS EduWORLD draws on the good practice in NBS along with theory and European resources into educational opportunities that could be further integrated into formal education programmes across all European Qualifications Framework levels and within informal and non-formal adult training programmes.

1.1. Overview of the NBS EduWORLD Learning Units

NBS EduWORLD responds to a gap in sustainability education. There is the advent of good practice examples in NBS, such as urban greening and regeneration; however, this remains ad hoc, fragmented and disconnected from mainstream curricula and professional training. Traditional sustainability competence frameworks have only recently begun to address the role of nature explicitly. The European Union's Sustainability Competence Framework (GreenComp) includes "promoting nature" as one of its competences, demonstrating the emerging role of nature in driving transformative sustainability education (Bianchi et al., 2022).

Building on this momentum, NBS EduWORLD sets out to integrate NBS more deeply and coherently into education systems. NBS EduWORLD developed a flexible, modular suite of 50 Learning Units (LUs) at the higher education level to contribute to the integration of NBS into a wide range of educational contexts—formal (e.g., Higher Education Institutions HEIs),

universities and vocational institutions), informal (e.g., community workshops, public consultative forum events), and non-formal (e.g., lifelong learning and professional development programmes). These LUs are grounded in active, outcomes-based pedagogical approaches and offer content tailored to the practical realities of diverse learner groups — from students and researchers to local authority planners, entrepreneurs, and civil society actors (Kennedy, 2006). The pedagogy emphasises deep learning — not merely transmitting information about NBS but enabling learners to engage critically and apply knowledge in real-world contexts (Kolb, 1984; Biggs & Tang, 2011). They address all stages of the NBS lifecycle: planning, delivery and stewardship, outlined in the Connecting Nature cycle work, which includes aspects of financing and business models, technical solutions, co-production (co-creation), reflexive monitoring, governance, nature-based enterprises and impact assessment to upscale NBS in various settings (Hölscher et al., 2022).

NBS EduWORLD developed 50 Learning Units (LUs) through a participatory co-creation process grounded in transdisciplinary contributions. Project partners, including higher education institutions (HEIs), local government networks, policy institutes, and non-profits, collaborated through interactive workshops and focus groups to identify key NBS topics, learning needs, and strategies for co-designing the curriculum. These sessions also collected input from learners, educators, policymakers, and professionals such as engineers, architects, planners, and Nature-based Enterprise (NBE) actors. This collaborative approach led to a curriculum that integrates real-world examples, peer learning, expert insights, and key European resources (Dowling et al., 2025).

While the LU development identified pressing NBS educational needs at the higher education level, contextual priorities, and thematic gaps through collaboration, it is the pilot phase that demonstrates whether the LUs meet the needs of this diverse group of learners. By embedding NBS education across all levels and sectors, this pilot phase aspect of the initiative addresses a critical capacity gap. Research shows that one of the main barriers to implementing NBS is a lack of trained professionals and informed decision-makers. The NBS EduWORLD LUs work to overcome this by cultivating “NBS-competent” individuals—graduates, planners, engineers, public servants, entrepreneurs, and community leaders—equipped to implement and advocate for NBS in their respective domains. In doing so, the project strengthens the links between education, policy, and practice, accelerating the widespread and effective adoption of NBS across Europe and beyond. The pilot phase reinforces the value of the co-creation process by showing that the case studies, NBS strategies, peer learning, and reflection activities within the LUs support learners in achieving their intended outcomes and in developing into “NBS-competent” advocates and decision-makers.

This report focuses on the piloting and testing phases of these LUs in various settings, aimed at refining the components of NBS education — including good practices, case studies, and the alignment of NBS with EU and international competencies — to create effective NBS learning opportunities.

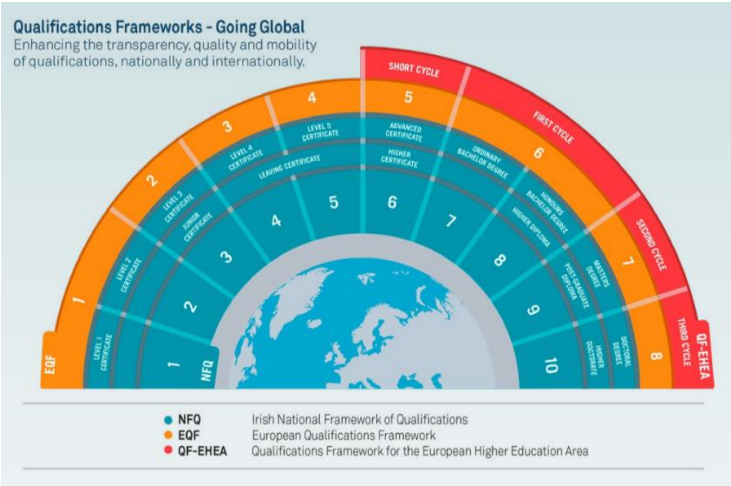
1.2. Role of Education in the Implementation of NBS Education

This NBS Piloting and Assessment of Stepping Stones and Education Journeys Report focuses on the advancement of capacity-building for NBS across the spectrum of higher, vocational, and entrepreneurial education along with the addition of professional training. It addresses university courses, vocational programmes, non-formal adult education, lifelong learning opportunities, and professional training sessions designed to embed NBS thinking in formal curricula and informal training alike (Dowling et al., 2024). The scope builds on insights from NBS EduWORLD's earlier evaluation of NBS in education through the framework and guidance evaluation and partner experiences, aligning content with identified gaps. A key focus is fostering institutional leadership to understand the value of NBS education and mainstreaming NBS across disciplines and sectors, bridging academic knowledge with practical implementation. This strategic work is timely; there is a recognised growing demand for NBS expertise in cities and industry, with identified shortages of skilled professionals (Mačiulytė & Durieux, 2020).

The regular exposure of NBS in various educational contexts is crucial to building the future of NBS leaders in professions and in communities. This is the cascade of creating clear stepping stones in NBS education: the need for regular touchpoints of NBS awareness-raising that may start as early as primary or secondary school or in undergraduate higher education courses. This early exposure to NBS makes it easier to recognise the benefits of NBS later in vocational, entrepreneurship or professional training programmes. NBS EduWORLD's work at the higher education level brings together higher, vocational and entrepreneurship education that also encompasses professional development programmes for public sector and local authority professionals.

Across NBS education, the potential to integrate it into formal accreditation remains an attractive prospect across the various levels of the European Qualifications Framework (EQF). Figure 1 presents the different EQF levels and their alignment with vocational and higher education in Europe (Quality and Qualifications Ireland, 2019).

Figure 1. European Qualifications Framework and Academic Qualifications in Europe (with specific reference to Ireland as an example).



The NBS EduWORLD tagline reinforces the crucial link between NBS and education: *'Learn from Nature, Teach from Nature, Grow from Nature'* (NBS EduWORLD, 2023).

1.2.1. Higher Education

Integrating NBS education into higher education courses is vital for equipping students in diverse fields such as engineering, urban planning, environmental science, and policymaking with systems thinking, ecological literacy, and the skills needed to design and implement nature-based strategies for community and ecosystem well-being, in alignment with the European sustainability competence framework GreenComp (Bianchi et al., 2022). Higher education in Europe follows a learning outcomes model aligned with the European Credit Transfer System (ECTS) to build critical and analytical thinkers, a goal that can be further supported through the lens of NBS. Thus, NBS serves as a transdisciplinary lens for students to explore climate, social, economic, community, and environmental challenges. Through hands-on, place-based learning, students bridge the gap between theory and practice by applying NBS approaches to real-world problems in context-specific ways. As NBS initiatives are increasingly recognised in Europe as a viable and sustainable solution to many challenges facing urban, rural and coastal communities, higher education becomes a catalyst to educate tomorrow's professionals, practitioners, and policymakers to embed biodiversity and climate resilience into their work.

NBS EduWORLD stands at the forefront of this educational transformation by developing a suite of open-access pedagogical tools tailored for higher education. The 50 LUs align to the EQF levels 6 to 8—across undergraduate and postgraduate programme levels (Europass, European Union, n.d.). The LUs go beyond providing supplementary classroom content; they act as practical resources enabling academic staff, researchers, professional services personnel, and students to build awareness of and deepen their knowledge on NBS concepts, relevant policies, and successful real-world examples. The aim is for the integration of NBS education to contribute to the institutionalisation of NBS education, ensuring that university graduates emerge not only professionally competent but also environmentally and socially conscientious, poised to drive the European Green Deal and transition to a greener future (European Commission, 2019).

1.2.2. Vocational Education

Practical knowledge on NBS can also be disseminated through vocational education programmes, including continuing professional development training for those who may be directly involved in NBS implementation. This includes vocational learners, such as local authority staff (e.g., town planners, project managers, environmental officers, community development workers, ecologists, and technicians). It can also include other learners, such as farmers who may be 'NBS curious' and wish to integrate these types of solutions into their farming practices or collaborate with local authority planning teams. It may also include community leaders who play a crucial role in the long-term planning, delivery, and stewardship of NBS in their communities. Providing them with NBS education enables these leaders to understand its importance and become advocates, helping their communities take ownership of NBS projects.

The LUs for vocational education are tailored modules focused on project management, governance, stakeholder engagement, financing strategies, and on-the-ground implementation. These units are aligned with the EQF and structured to build transferable skills through hands-on, place-based learning, this may be as broad as the integration of ecosystem services into urban planning, stormwater management, designing public spaces, public procurement of NBS and community engagement processes.

The LUs offer a 'taster' on NBS education at vocational or professional development level that may enable the learners to consider progression routes and deeper learning in NBS at higher education level.

1.2.3. Entrepreneurship Education

It is recognised that a successful NBS ecosystem is effective with the addition of NBEs (Hölscher et al., 2022). Even entrepreneurs with a background in the values of sustainability may not be familiar with the concept of NBS or how their entrepreneurship journey can support the local NBS ecosystem. To address this, specialised NBE and entrepreneurship NBS education is integrated into NBS EduWORLD, with 10 of the 50 LUs targeting this entrepreneurship group. Likewise, 10 LUs are tailored for vocational education and 10 LUs for higher education (3rd level), (see Chapter 7 and the list of LUs).

Designing entrepreneurship education on NBS remains a challenge. Entrepreneurship related to nature is a small emerging market in Europe and can include many diverse sectors related to nature from product development to tourism. There is also a challenge to reach NBEs due to their lack of engagement in traditional business networks. Moreover, the content for NBE education is also a challenge, to highlight financing and business models along with measuring impact. Many entrepreneurs lack the resources (e.g., time, money) to pursue NBS education, rendering the ease and bite-sized nature of the LUs an even more attractive educational offering for this learner group. Incentives such as accreditation and opportunities for networking with like-minded entrepreneurs were also incorporated into the curriculum design.

Therefore, as outlined in this report, the piloting phase of this process of the LUs was important to ensure that the design, delivery and content of the entrepreneurship-specific LUs meet the needs of this group of learners.

1.3. Background

The piloting and testing phase of LU development marked a critical stage in refining and validating the educational content designed to build NBS capacity across Europe. Following the co-design of these 50 LUs, structured testing with a diverse range of learners in the form of pilots was carried out across formal, informal, and non-formal adult educational settings, including universities, local authority training programmes, entrepreneurship workshops, and community education initiatives. The piloting process included OCC (Ireland), and Almada Municipality (Portugal), along with other Horizon Europe projects. In addition, the Learning Unit pilot phase delivery team included TCD, ICLEI, PPMI, Horizon Nua and Big Van Ciencia, designing, delivering, reflecting on, and revising the LUs following the testing period.

The piloting also reinforced the adaptability of the LUs to serve both as standalone learning experiences and as a scaffolding towards other training pathways. These pathways include components within broader education and training programmes, such as accredited courses on the EQF level and lifelong learning initiatives. NBS EduWORLD is designed so that its learning architecture supports the wider adoption of NBS through capacity building, cross-sectoral engagement, and a robust response to the urgent skills gap in Europe's green transition.

2. Methodology

To understand the methodology applied for the piloting and assessment phases of the LUs, it is recognised that this report is an extension of the design of LUs and its related architecture outlined in the NBS education report 'NBS Higher Education and Entrepreneurship Architecture' (Dowling et al., 2025). The pilot testing phase and assessment of the next steps in the education journey are crucial to ensure that there is the potential to embed NBS education across the education lifecycle: from teacher education to bring NBS to classrooms at primary and secondary school levels, to higher education and across vocational, adult, and continuing education spheres and in professional and community settings.

The approach to testing and piloting of LUs takes an active learning process, involving various partners and iterations towards reviewing, delivering, reflecting and refining the LUs. This real-world testing enabled the project team to assess how well the LUs responded to various learner needs of NBS content. As outlined in this report, the feedback loop informed both the LU content revisions and pedagogical enhancements to ensure the LUs remain practical, relevant, and impactful for targeted learners. Figure 2 outlines the steps of the LU development process, noted as stage 4 in this process (Dowling et al., 2025)

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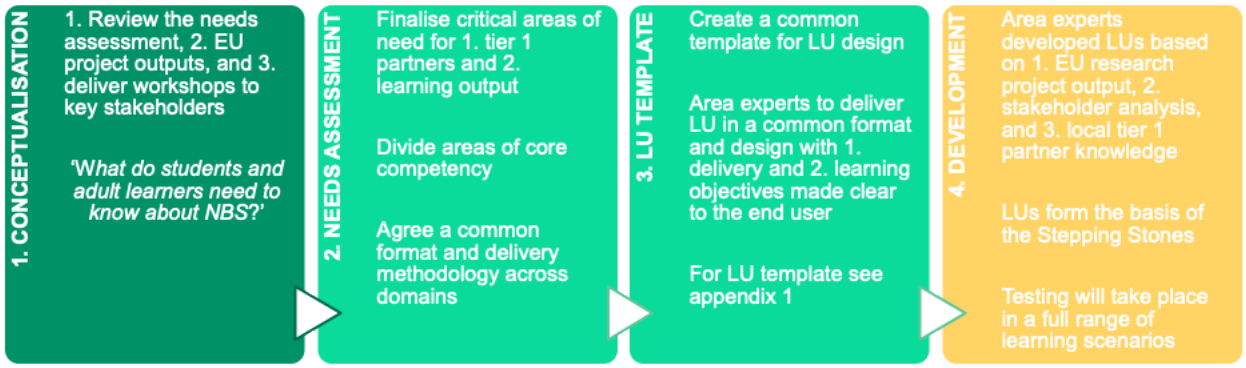
Figure 2. Learning Unit development process.



2.1. Implications of Learning Unit Architecture

2.1.1. Piloting Phase

The LU architecture, which includes standardised Excel templates developed by the project team (Dowling et al., 2025), provides a clear overview of each module for both instructors and learners. These templates outline the module's purpose, suggest a standard 50-minute delivery format, and show how each LU aligns with pedagogical frameworks such as 21st Century Skills (Gras-Velázquez et al., 2020) and European sustainability resources, including the *Green Comp European Sustainability Competency Framework* (Bianchi et al., 2022).

Through focus groups and workshops with key partners OCC and Almada Municipality identified key NBS themes, topics, and strategies to contribute to LU design. In addition, Big Van Ciencia (BVC) undertook a consultation in the teacher education sector at the Scientific

Monologues events at the Universidad de Burgos, Universidad de Barcelona (Figure 3). The result was an LU for Teacher Education (LU 19 – NBS In and Out Lab, see section 8.1)

Figure 3. Learning Unit Consultation for Teacher Education – Big Van Ciencia at Scientific Monologues 2024 event, Universidad de Barcelona.

The pilot and testing phase provided an opportunity to return and assess whether the LUs adequately met these needs. This purpose of the pilot phase was to ensure that the architecture of NBS education presented in the LUs responds to real-world challenges and opportunities, aligned with local needs and sectoral demands. The feedback following the piloting phase was the opportunity for reflection to refine the LUs to better address the needs of partners and learners. Figure 4 shows the Big Van Ciencia's piloting of LU19 – In and Out Lab with secondary school teachers in Spain, creating a feedback loop to build relevant NBS education.

Figure 4. Learning Unit Testing by Big Van Ciencia with secondary school teachers at Universidad de Barcelona.

2.1.2. Assessment of Stepping Stones and Education Journeys

The LUs contribute to the broader goal of NBS EduWORLD: creating meaningful pathways for learners to engage with NBS across all stages of education and training. The LU architecture design responds to this need for stepping stones on a lifelong NBS learning journey. First, the LU design template asks for the LU designer to present curriculum to a particular EQF level, with learning outcomes that align to that educational learning level. The LUs are searchable by EQF level (see European Qualifications Framework, European Commission, 2020) and can

be used by instructors to select appropriate units for vocational or higher education learners. This enables progression through different EQF levels as required, supporting the development of NBS educational competencies (see Appendix 7.1: List of 50 Learning Units).

Some LUs are designed to scaffold onto each other, forming multi-part workshops that deepen understanding over time. For example, LUs 45, 46, and 47 together form a three-part workshop on the co-production element of the Connecting Nature Framework (see Appendix 8.1: List of 50 Learning Units). LU 45 focuses on Planning in Co-Production, LU 46 explores Delivery in Co-Production, and LU 47 addresses Stewardship with Co-Production. This sequence demonstrates how the LU architecture supports progressive learning by creating internal "stepping stones" within a broader education journey. These modular combinations also introduce learners to key European NBS resources and concepts in a structured way. The piloting of this workshop in a higher education context is assessed later in this report.

The LU architecture also encourages links to other European resources, including case studies, NBS theories, concepts and practical strategies for implementation. This also encourages both the learner and instructors to a vast world of NBS educational resources available that can enhance an individual's NBS education journey.

2.2. Piloting: Implementation of Learning Unit Testing

Following the design of the 50 LUs, in January 2025, NBS EduWORLD set out to test the efficacy of the LUs through a piloting phase. This piloting phase extended from January 2025 through May 2025. NBS EduWORLD partners involved directly in the piloting of the LUs included:

- Trinity Business School, Trinity College Dublin
- ICLEI
- PPMI
- Horizon Nua
- Big Van Ciencia

These were the same organisational partners involved in the design of the LU architecture and 50 LUs at the identified educational levels.

2.2.1. Selecting and Securing Testing Sites

The selection of testing sites for the pilot phase started prior to the completion of the LUs in February 2025. There was a recognition that the selection of the sites should align with the key partners involved in the initial consultation process, which included Tier-1 NBS EduWORLD partners and internal networks of the LU design partners. An overview of the securing testing sites is outlined in Table 1:

Table 1. Overview of partner organisations involved in securing and testing Learning Units (LUs) during the pilot phase

Testing Site	Type of Organisation involved in testing	Type of education	Involved in original LU consultation prior to design?	Partner involved in leading the testing
Trinity College Dublin – undergraduate course	NBS EduWORLD partner	Higher education	No	Trinity College Dublin
Offaly County Council	NBS EduWORLD Tier-1 partner (local authority)	Professional/ Vocational education	Yes	Trinity College Dublin
Almada Municipality	NBS EduWORLD Tier-1 partner (local authority)	Professional/ Vocational education	Yes	Trinity College Dublin
PPMI network	NBS EduWORLD partner	Professional/ Vocational education	No	PPMI
ICLEI	NBS EduWORLD partner	Professional/ Vocational education	No	ICLEI
C-FAARER Horizon Europe Project	NBS EduWORLD partner	Entrepreneurship Education	No	Horizon Nua
Trinity College Dublin – undergraduate, postgraduate programmes	NBS EduWORLD partner	Entrepreneurship Education	No	Trinity College Dublin
Big Van Ciencia	*NBS EduWORLD partner*	*Higher education (teacher education)*	*Yes*	*Big Van Science*
Trinity Business School – Executive Education	*NBS EduWORLD partners*	*Higher education, entrepreneurship education*	*Yes*	*Horizon Nua and Trinity College Dublin*

As outlined in Table 1, various sites were selected to participate in the pilot phase. All the sites shown in white boxes above were secured and completed the full pilot testing process. The grey box represents a site (Trinity College Dublin Executive Education) that was initially selected as a pilot site but was unable to fully complete testing due to extenuating circumstances. To mitigate this, a focus group session was held online to assess the efficacy of the LUs targeted to specific learners. In addition, the curriculum development team, involving both Trinity College Dublin and Horizon Nua, assembled to assess the materials and their relevance for a postgraduate higher education cohort interested in NBEs and broader NBS related entrepreneurship education.

2.2.2. Reviewing and Preparing Learning Units for Pilot Phase

The preparation for the pilot phase proved to be an excellent period for the LUs to be tested. At this early stage this was the opportunity to assess each LU for content flow, and some revisions occurred even at this early phase to aid with continuity and to align best with the LU learning outcomes.

Once the testing sites were confirmed, the next step was to select which LUs would be delivered at each location. All secured sites received a list of LUs and were invited to choose the ones most relevant for their identified learners (see Appendix 8.1 for the full list of LUs). The project team aimed to ensure that the selected LUs represented a diversity of types, including:

- Different education levels (e.g., higher, vocational, entrepreneurship education)
- Different modes of delivery (e.g., online lecture, in-person lectures, workshops, site visits)
- Different types of learners (e.g. higher education students, local authority professionals, entrepreneurs)

After working with pilot site partners, it was agreed on a suite of 16 LUs for testing in various locations, with various partners meeting the mixed criteria above. This represents pilot testing of 32% of all LUs designed as part of the project. In addition, 10 other LUs were involved in intensive focus group reviews with project partners to enable thorough reflection and review. Overall, this led to the direct engagement of 26 LUs in a form of testing, representing 52% of all LUs designed during this project.

2.2.3. Strategies for Piloting the Learning Unit Delivery

The partners involved in the piloting phase employed different strategies to deliver LUs at secured testing sites. Some partners decided to embed the LUs into the curriculum of an existing course or programme. This was an effective strategy for Trinity College Dublin that integrated the LUs directly into the module syllabus for the Social Innovation: Tools for Social Change undergraduate interdisciplinary course. Big Van Ciencia integrated the LU into a teacher education programme at a Spanish university as a testing site. Horizon Nua also adopted this approach by adapting the LUs into an online course for the C-FAARER Horizon Europe project, working with seaweed entrepreneurs in Europe and beyond.

In more informal and non-formal adult learning settings, partners involved in piloting arranged training sessions or workshops that were dedicated to testing the LUs. This was employed in the case of local authority professionals in person with OCC and online with Almada Municipality.

Still, other strategies were employed to test LUs with a broader audience. PPMI and ICLEI promoted online webinar events to test LUs. Both project partners decided to draw on their broad internal networks of members and supportive organisations that were "NBS curious" to register and attend these testing events.

3. Learning Unit Pilot Testing Phase

3.1. Pilot and Testing: Higher Education

The testing in higher education focused on Trinity College Dublin as a testing site. LUs were integrated into the transdisciplinary module offered to undergraduate students called “Social Innovation: Tools for Social Change”. Each year, this module selects a theme for social innovation. This year, to align with the testing of the LUs, the theme was NBS. The learning outcomes for the 5 ECTS module were as follows (with emphasis added to highlight the inclusion of NBS as the module theme):

1. Build your knowledge base on social innovation and **nature-based solutions**, drawing on literature, research projects, current practices, and key actors in these fields.
2. Deliver individual development and teambuilding workshops
    a. Individual development workshops will focus on you, your leadership style, and the development of your leadership capacity.
    b. Teambuilding workshops will support you in working in a multidisciplinary team.
3. Explore through cases, exercises, action, and reflection how processes of social innovation are used to address key societal challenges through the development **of nature-based solutions and their application in areas such as climate change mitigation, food security, and disaster risk reduction.**
4. Engage you in an individual project where you will select, contact, connect with, learn from a leader in the field, and share what you have learnt with your module peers.
5. Place you in a team-based project in which you apply some of your module-based learning to a challenge that can be addressed through the lenses of social innovation and **nature-based solutions**.

The testing of the LUs included asynchronous online lectures available to students as part of their self-directed learning, in-person lectures and in-person workshops. The LUs were delivered as they were designed by the project team with the addition of a title page and reflective question page, as outlined in Figures 5, 6 and 7 below.

Figure 5. Customised cover PowerPoint for the standard Learning Unit 4 – Introduction to NBS: Nature’s Benefits and Ecosystem Services.

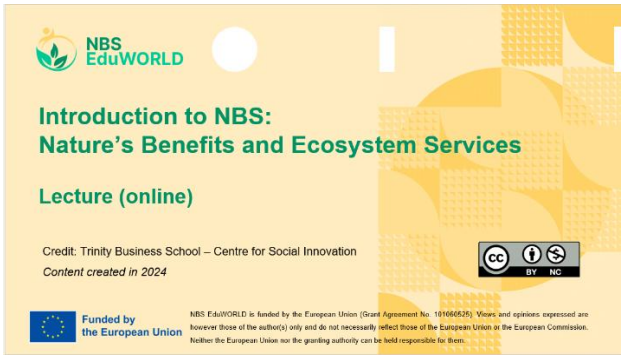
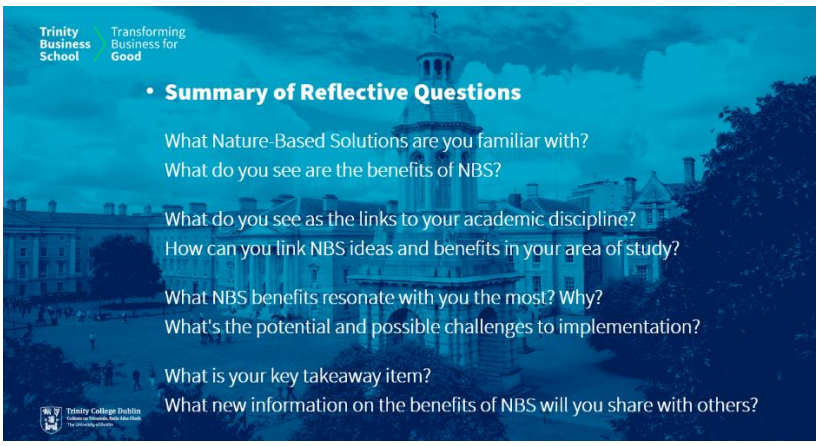


Figure 6. Customised cover PowerPoint for the standard Learning Unit 4 - Social Innovation: Tools for Social Change.

Figure 7. Sample of a final slide following the standard LU.



These reflective questions, with responses offered by students, provided some formative feedback on the LUs how effective they are in achieving their learning outcomes and acted as a first step in evaluating the LU and where they could be improved from the learner's perspective. Instructors were also asked to offer their feedback on delivering these LUs as part of the curriculum.

This undergraduate module also included the testing of higher education LUs 45, 46, and 47, which together formed a complete workshop on co-production. In the in-person session, 24 students worked in small groups, completed activities, and shared their reflections on NBS, following the structured lesson plans from the module. The workshops were delivered as part of a 110-minute class, therefore enabling ample time for an introduction and time for verbal feedback and anonymised written feedback following the sessions. The written feedback included students offering their perspective on the LU resources on what went well and how they could be improved to enhance the understanding of NBS concepts and examples.

Overall, the feedback was very positive and offered suggestions for improvement that related to the LU slide materials and lesson plan timing offered in the LU Excel template. Some examples of the feedback offered by the undergraduate students include:

- "Good opportunities for discussion."
- “Got to think creatively about NBS."
- “Engaging content."
- “Big class discussions along with small group discussions."
- “Maybe more explanations on the slides – make the concepts clear with examples."
- “More real-life examples of NBS and how it directly affects us."
- "Less time needed for brainstorm reflections [group activity]; most were done early."

From the instructor's perspective, it was evident that the students were able to understand the key concepts of NBS and apply them appropriately at the undergraduate level in their assessments, which included group poster presentations, blogs/vlogs (video interviews) and in-class reflections. The design of the module curriculum balanced the needs of meeting the overall learning outcomes as an educational experience for students balanced with the needs of having an appropriate testing site for the LUs. Therefore, this module included a portion of attendance and class participation as part of the module assessment, thus motivating students to participate fully in the LU materials, at least partly motivated through module grades.

With a commitment to including sustainability themes in the curriculum, TCD also integrated other LUs into other courses, including undergraduate and postgraduate modules on Global Supply Chain Management and Designing Social Innovation and Delivering Impact. The latter undergraduate module integrated an asynchronous (pre-recorded) LU initially designed for entrepreneurs (LU 22 – Financing NBS) as an additional testing site.

The formative feedback from the LUs throughout the delivery of the modules allowed for some revisions to take place by the project team to see if the improvements helped with the feedback towards a final summative assessment of the LUs. For example, early feedback on the LUs in February 2025 around the amount of text on slides and requests for more NBS real-life examples were added to the module tested later in the semester.

Big Van Ciencia targeted teacher education programme in Spanish higher education as a pilot testing site. The LU focused on how to design NBS activities in formal primary and secondary education, including outdoor education. This group of student teachers for secondary school from various academic disciplines offered feedback to enhance the content to reflect the interdisciplinary nature of the science and non-science teachers that may wish to integrate NBS into their future classrooms.

As noted in earlier NBS EduWORLD reports on LU design and architecture, it demonstrates how the LUs aim to address the identified needs in higher education curriculum: “the need for interdisciplinary content, lack of clear pathways for sustainability careers involving NBS, and the absence of project-based learning focused on real-world applications… Students engage in scenario planning and stakeholder analysis exercises that simulate real-world decision-making processes” (Dowling et al., 2025, p. 11). It was evident that the piloting of the LUs in the higher education context addressed these needs, especially after some revisions following student feedback. The exposure for higher education students (and instructors) to EU-funded

research and innovation projects, such as NBS EduWORLD, is also important to showcase the plethora of evidence-based practices and resources on NBS available from EU-supported initiatives (*CLEVER Cities*, *URBiNAT*, *NetworkNature*, *GoGreenRoutes*, and *Connecting Nature)*, which reinforces the potential of NBS within sustainability education.

3.2. Pilot and Testing: Vocational and Professional Education

PPMI and ICLEI Europe led the pilot and testing of vocational and professional LUs, responding to needs among public servants, local authority actors, civil society leaders, and non-formal educators. TCD also engaged in the testing with local authority Tier-1 NBS EduWORLD partners – OCC and Almada Municipality.

The ICLEI and PPMI strategies for testing focused on online events open to the public and targeting existing networks of these organisations with a focus on NBS connections. Figure 8 shows an example of a promotional image for an event testing the public procurement LU by PPMI, one of NBS EduWORLD's Consortium members:

Figure 8. Promotional image for a Leaning Unit testing webinar event organised by PPMI.

Dissemination of the event included the wording: "The webinar will be testing one of the learning units prepared under WP4, and we look forward to your active participation – especially from our partners from municipalities, and NBS EduWORLD partners". This shows a good example of the potential practical use of the LUs as flexible learning opportunities on topics that resonate with those interested in building green solutions and sustainability in their professional work.

The webinar event had a total of 23 participants, mostly professionals from municipalities in the EU, who work closely with procurement. The LU was tweaked to fit the format of a webinar, replacing the interactive features with a question period, case study speaker and discussion period. Participants were engaged, offering constructive feedback on the LU, requesting access to the presentations. The LUs on the project website were promoted and shared during the webinar. During the event, participants also discussed NBS Education and how procurement processes can include awareness raising and make use of the projects to

educate local communities. These findings will also inform the NBS EduWORLD policy recommendations.

The vocational and professional LU testing organised by TCD involved an in-person workshop with OCC in April 2025. This local authority organised a wide array of participants to attend the testing of the LUs: architects, planners, community development personnel, and engineers, along with those involved in promoting learning in the local authority area (e.g., library services, community and enterprise personnel). The participants understood that this was a pilot and testing of designed LUs, which were chosen by OCC. The delivery of the units was conducted by both TCD and OCC. This was crucial, as both partners were not directly involved in the development of the vocational LUs, and therefore it allowed for the simulation of what it might be like for an instructor to take the LU and deliver it.

Following the delivery of each LU, there was time allotted for candid feedback, both verbal discussion on ways to improve the LUs relayed to project partners for revision. The in-person workshop also sparked discussion on various topics, encouraged in the LU activities, which was identified as a valuable component of this process, especially across multiple stakeholders even within one organisation. This assisted in reinforcing the importance of the involvement of multiple stakeholders in the success of NBS implementation, demonstrating the relevance of these LUs as a platform for internal relationship building and collaboration.

The Almada Municipality (CMA) also participated as a testing site for LUs. TCD organised an online testing event with the project partner. What was unique about this pilot was the opportunity to present a case study LU that was familiar to the local authority participants. In testing the LU, this process was also a chance to enhance the case study details and materials (e.g., photos, reference links) to make it more compelling and relevant to a wider audience.

This vocational testing period enabled pilots to occur in rural (OCC), urban (PPMI, ICLEI Europe) and coastal (CMA) contexts. The feedback reinforced the need and the relevance of these LUs to build professional competences in NBS and gain practical knowledge on NBS practices that may be adapted in a participant's own professional context.

3.3. Pilot and Testing: Entrepreneurship Education

Horizon Nua in collaboration with the C-FAARER project, tested the NBE LUs through a 5-week online course adapted to those who are interested in setting up a new venture or looking to scale an existing business in the Regenerative Ocean Farming **(**ROF) sector.

The online programme delivered in May 2025 was designed to equip the innovator or entrepreneur in ROF with the business and technical skills and knowledge to develop and scale a new venture in a sustainable manner using best practices and case studies. The topics covered in the online course were adapted to a particular context (Regenerative Ocean Farming) but involve the direct testing of LU content as follows in Table 2:

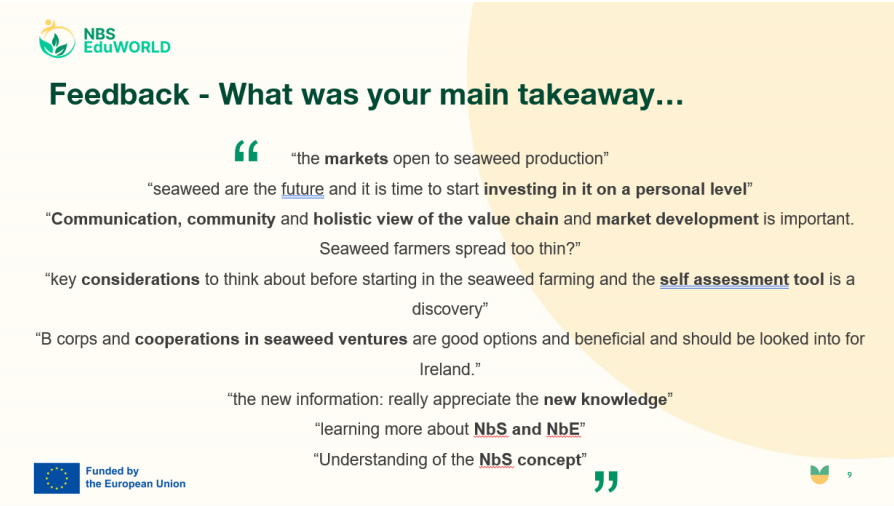
Table 2. C-FAARER project Online Course in ROF.

Theme in the Online Module	Learning Unit Tested
Introduction to New Ventures in ROF	LU 20 – Introduction to NBEs
Business Models for New Ventures in ROF	LU 21 – Business Models in NBEs
Financing for New Ventures in ROF	LU 22 – Financing NBEs
Strategy for New Ventures in ROF	LU 24 – Measuring Impact: How and why NBEs should measure impact
Technical Considerations for New Ventures in ROF	LU 28 – Water based NBS entrepreneurship

This online course adapted the LUs to demonstrate their ability to be customised for key NBE sectors. The focus of the course and LU pilot is to deliver new knowledge and attitudes needed to develop a sustainable regenerative ocean farming business. The LUs were designed to focus on the knowledge for NBEs, such as market development and business models. The LUs also allowed for the flexibility of key technical considerations that could target the participant audience (seaweed growers and those working in/researching aquaculture or seaweed), such as choosing a site, seedlings, and farming management. The purpose was also to build the attitudes and values related to NBE and NBS entrepreneurship, including the link between sustainable entrepreneurship and the welfare of the natural environment and more specifically for this online course exploring the value of seaweed for investment, the community, communication and cooperation.

With 15 registered participants from across Europe and beyond, the online synchronous course that tested the LUs received a positive response, demonstrating a need for this programme in the aquaculture sector. The LUs were flexible in offering the key information that could be adapted for this NBE context. Figure 9 shows a sample of the feedback from the pilot that was shared by Horizon Nua during an ICLEI webinar in June 2025.

Figure 9. Feedback from the NBE testing of the entrepreneurship LUs with the C-FAARER Horizon Europe project.



Aligned with the NBS strategy highlighted in the Connecting Nature Framework, Horizon Nua completed a reflexive monitoring process following the completion of the online course that integrated the LU pilot project (Hölscher et al., 2022). This reflexive monitoring process examined the following themes, and specifically for the LU evaluation, provided the following feedback:

Planning and development:

- Generic LU content as a basepoint was an enabler. The LUs were translated easily from conceptual context to a practical context with content from industry applying C-FAARER project materials.
- Participants found content relevant and informative, valuing examples and case studies to enrich the learning experience. There was feedback that the LUs content may be too ambitious to be covered in a 50-minute session, thus a revision to refine the concepts covered and allow more time to digest the content.
- With the timeframe allotted for the LUs peer-to-peer learning was limited – the feedback from participants was to prioritise this sectoral specific learning
- Include icebreakers within the LU content. These types of activities allow participants to build trust and relationships with each other. This allows for better quality peer-to-peer learning and networking to develop during the LU.

Logistics:

- Attendance rates of participants were lower than anticipated — this is common for online programmes, especially for unaccredited courses. Upon reflection and from participant evaluations, the LU content was not identified as the reason for low engagement.
- 50 minutes per LU is too little time for a group of 10 participants or more. The potential to double up LUs to allow for some additional content but also more time for peer-to-peer learning was useful. Alternatively, it was suggested the LU be used as a framework for core content with an additional 30–45 minutes added before, during and after the LU content in a customisable fashion to increase the opportunity for sector-specific NBE learning, peer-to-peer learning and reflection.
- Describing the online course content as webinars implies to participants that they are passive players and required only to listen to content. Emphasising the LU content in a workshop or training increases the expectations from participants that they are expected to be active in their learning and that there are interactive activities involved in each session.

Outputs, Future Planning and Key Takeaways

- The reflexive monitoring process showed that the LU is the foundation for NBS and NBE learning. There was feedback that this could be complemented with industry-specific speakers, which would also motivate attendance by participants. This offers that balance between the theoretical or conceptual ideas and even some of the case studies with an authority or professional that can speak of their real-life experience, responding to questions from participants. Thus, LUs become a catalyst for NBS learning, not the only source of the learning material.
- Consider how the LUs might assist participants to work towards a tangible and practical output (e.g., a business plan, strategy, business model). While the revision of the LU

could offer this type of practical element, the feedback showed that in many cases this is a local activity that requires local templates; therefore, the LU can act as a guide to customise the materials to offer such an output.

This reflexive monitoring activity enabled Horizon Nua to refine the NBE-related LUs to include fewer concepts in a 50-minute session and allow more depth and peer-to-peer learning to emerge through the suggestion of interactive activities in the LU complementary lesson plan.

Horizon Nua in conjunction with the Invest4Nature project, also delivered a series of in-person workshops on nature-based entrepreneurship to local governments in Aarhus (Denmark), Cascais (Portugal), Poznan (Poland) and Tyrol (Austria) between April and June 2025. This allowed for an extended piloting phase of the basic LU 20 (What is NBE?), explaining the basic aspects of nature-based entrepreneurship and highlighting the other LUs that offer additional learning in NBEs impact assessment, financing and market development. As noted earlier in this report, the testing of the NBE LUs also took place in a higher education context with students learning about nature-based entrepreneurship at Trinity College Dublin, including the Social Innovation: Tools for Social Change along with the Designing Social Innovation and Delivering Impact undergraduate modules.

3.4. From Testing to Revising Learning Units: Building NBS Education

This section summarises the learning from the pilot and testing phase towards the revision of the LUs to ensure that they are relevant and offer effective learning opportunities for a variety of learners in a range of settings.

Some of the key learning that led to revisions of the LUs included:

- Recognising too many concepts were included in a 50-minute period. Revisions to include less concepts or policies within a LU allows for learners to achieve more depth of learning and explore a concept more thoroughly.
- Building in more case studies and practical examples. Some LUs focused on the NBS concepts, and participant feedback showed the interest in seeing more real-life examples. By drawing on a range of European projects and resources, the LU were revised to include practical examples and case studies to bring the NBS concepts to life.
- Designing more interactive activities and peer-to-peer learning opportunities within the LUs. An NBS concept comes to life when learners can discuss it, consider how they have interacted with NBS (or not), and consider the benefits of building NBS into planning and strategies and embedding it into communities and society. Discussions and debates allow for deeper learning opportunities. The revision of the LUs ensured that the complementary lesson plans (Excel LU template) encourage at least 2 interactive elements per 50-minute LU, a guide that is now included in all 50 LUs designed and revised through this process.

The effectiveness of the LU resources is important as a springboard for NBS learning. The LUs are a taster to enable those that are 'NBS curious' to begin to understand and even apply NBS concepts in their own professional contexts and initiate discussions in their communities.

Further testing of the introductory module LU20 Introduction to NbEs is planned for August 2025 in collaboration with the Business for Biodiversity Ireland Network, supported by the Government of Ireland. This initiative will introduce the concept of nature-based entrepreneurship to a much wider business audience, including mainstream businesses and the wider business support ecosystem.

4. Next Steps

4.1. Journeys to NBS Education: Learning Units Contributing to Mainstreaming NBS Education

The development of LUs as part of NBS EduWORLD represents an important step towards integrating NBS into mainstream education pathways and settings.

Long-term sustainability of resources: As noted in the NBS Learning Architecture Report (Dowling et al., 2025), the long-term sustainability of LU resources is critical for the continued proliferation of NBS education. There is a commitment to maintain NBS EduWORLD resources, including the Learning Units, until 2027. Beyond this period, other key European repositories for NBS and scientific materials, such as Oppla and Scientix®, may serve as hosts for these resources, ensuring ongoing accessibility. Horizon Nua is also exploring the potential of these modules as a resource for the Connecting Nature Enterprise Platform—at the very least, the NBE modules developed under this project.

Accessibility of resources: All LUs and their referenced resources are openly available under Creative Commons (CC BY 4.0). This open licence allows for instructors to freely access these materials, modify them and share them with learners.

Progression routes embedded in resources: The LUs are designed for specific formal education levels, including a progression route from vocational/professional levels through higher education along with entrepreneurship education to enable instructors to select the appropriate levels for their target learner group. While some LUs have similar titles, the learning outcomes differentiate the content for learners at different levels, following an outcomes pedagogy (Kennedy 2006). The more touchpoints that learners are exposed to NBS education, the more that it will become familiar, normalised and part of the general parlance in society.

Micro-learning opportunities: The LUs are all standardised as 50-minute units and offer a taster into NBS education. This helps build the confidence of learners – including those learners that are in positions to implement NBS in their professional work, such as engineers, planners and ecologists. With the recent popularity of micro-credentials, there is the potential for the LUs to serve as a foundation for NBS education to become embedded into incremental learning through the ECTS system. Learners in formal education can accumulate a smaller number of ECTS towards building qualifications at the undergraduate or postgraduate level. As the interest in NBS education builds, micro-credentials, using resources like the LUs, can be a way to build momentum and incentivise learners to consider studying NBS further towards a formal qualification.

Leveraging formal education's interest in sustainability: There is widespread interest in sustainability and embedding sustainability in mainstream education. With the advent of the Impact Rankings for higher education, that focus on an institution's ability to embed sustainability education and the Sustainable Development Goals (SDGs) into curriculum, NBS is an avenue to build on the appetite for sustainability materials, readily available through the LUs. Moreover, teacher education programmes are mandated to include education for sustainable development, global citizenship education, and the SDGs in the curriculum, as this

is cascading into primary and secondary school curriculum. Providing introductions to the topic of NBS allows a flexible learning opportunity to be presented to learners, thus satisfying an institution's 'sustainability agenda' and building NBS-aware students and educators.

Leveraging business and enterprise's interest in sustainability: The LUs also offer enterprises, businesses and nature-based enterprises, along with those that support enterprises, a platform for NBS education. For businesses, enterprises, or entrepreneurs aspiring to or also working with/for nature, the LUs can offer a scaffold of NBS learning and NbE education that can open up ideas to building further business ideas with sustainable impact. Economic development agencies and public sector bodies supporting business can also benefit from NBS education to be better informed as they consider the funding, business models and support available to nature-based business. The LUs may also appeal to large organisations that wish to build their knowledge base, including in NBS as part of their corporate social responsibility or sustainability programmes, ESG (environmental, social and governance) work or to address their climate action agenda.

Capacity-building with resources: With the LUs being open and modular in their design, an instructor, teacher, or lecturer can integrate a LU into an existing thematic lecture or curriculum learning outcome, building NBS knowledge and strengthening capacity. In addition, they can cluster a few of the LUs together for a workshop or NBS short course, thereby enhancing capacity further. The resources attached to the LUs are such that they can also easily facilitate self-directed or directed learning.

Dissemination of resources: Strategic dissemination is essential to maximise the impact of the LUs. The next section outlines the strategic potential of the dissemination and promotion of the LUs to various networks and organisations.

4.2. Dissemination of Learning Units to Contributing to Mainstream NBS in Higher Education

To build NBS education in the mainstream also requires a broad base of promotion and dissemination. The LUs become a gateway towards sparking NBS conversations, knowledge, skills and competences. This section outlines some of the ways that NBS EduWORLD has already begun the process of dissemination, demonstrating the potential for broad-based recognition and mainstreaming of NBS education.

4.2.1. Higher Education – Potential for LU Dissemination

TCD plans to embed the higher education LUs into their relevant undergraduate courses (e.g., social innovation and sustainability courses) and will be promoted as resources for students who wish to become NBS literate.

Other active academic partnerships are benefitting from the promotion of the LUs. Interactions with Swedish higher education institutions, including SLU and Stockholm University, both with deep sustainability values, showed interest in disseminating the LUs to students, alumni and academic staff to further promote NBS education.

Engagement with branch campuses of North American universities in Europe is also a novel way to start to build capacity in NBS with students studying from abroad. For example, during the pilot phase, project partners met with Georgia Southern University (USA), which has a branch campus in Wexford, Ireland. Part of the focus of their study abroad programme is community-based sustainability projects, including supporting NBS in the local coastal community. There is scope to explore how the open-source nature of the LUs could be a way to offer European policies and content to the delivery of NBS education that complements the practical service-learning projects students engage in while studying abroad.

Big Van Ciencia intends on continuing to deliver the LU within teacher education programmes in Spain. This presents the duality of educating a diverse group of student teachers on NBS while also delivering a course in English, thus building familiarity of NBS-related vocabulary.

There is potential for higher education institutions to develop micro-credentials or digital badges to recognise the completion of a combination of LUs as part of a wider higher education curriculum on NBS education. Higher education institutions could be the educational partners with public sector agencies, community voluntary organisations or professional bodies to design sector-specific NBS education micro-credentials.

4.2.2. Vocational and Professional Education

NBS EduWORLD Tier 1 partners OCC are considering the integration of LUs into their Offaly Climate Action Team induction and training for new staff and may draw on the LUs for community climate action workshops.

ICLEI and PPMI identified opportunities to extend the promotion of the LUs. These organisations, leveraging their ‘network of networks’, can promote the LUs as professional and vocational level education to city representatives, local authority personnel and public servants. This extends the existing work by ICLEI and PPMI regular knowledge sharing webinar events (such as ICLEI’s work on urban sustainability), highlighting how their broad networks can access the open-source LUs to build NBS education.

Vocational education agencies, such as the Education and Training Boards in Ireland, have identified an interest and need in integrating NBS education into their existing suite of programmes that are at EQF level 4 and 5 (or lower as required). For example, project partners have met with the Laois Offaly Education and Training Board in the LU design phase and followed up with these organisations at the pilot phase (with some members participating in the OCC pilot in-person event in April 2025). Dowling et al. (2025) offer the example of a vocational training centre that could develop NBS education in procurement and governance for public servants, drawing on the LUs to offer context on EU policies and frameworks relevant to advancing their knowledge, understanding and potentially their work progressing NBS.

4.2.3. Entrepreneurship Education

Horizon Nua plans to further disseminate NBE learning units through the capacity-building toolbox being designed in the GoNaturePositive! project. Moreover, the LU pilot testing with the Horizon Europe-funded C-FAARER project shows how cross-pollination of these

programmes can build capacity in complementary fields and further build nature-based enterprises.

NBS EduWORLD is also exploring how the entrepreneurship LUs can be disseminated through local governments structures to integrate into their strategies and training to raise awareness of and stimulate local nature-based entrepreneurship. Many local authorities and public sector agencies are involved in supporting enterprise development. An NBS education through LU dissemination would inform those involved in supporting, funding and promoting entrepreneurship, including NbEs.

4.2.4. Non-formal and Informal Adult Education

The LUs are an open-source, flexible and readily available NBS education platform well situated to be adopted into non-formal and informal adult education settings. Community organisations, environmental networks and NGOs may adapt the LUs to offer to their local communities to become informed on aspects of NBS. The interactive nature of the activities in the LUs allows for the potential for learner dialogues and debates, leading to brainstorming or ideas to initiate or lobby for NBS in their local community.

The Task Force on NBS Education is part of the NetworkNature Task Forces to build capacity and promotion of NBS and is coordinated by NBS EduWORLD. Led by TCD on behalf of NBS EduWORLD until August 2025, the Task Force includes a network of educators from all levels of education, including active researchers and academic staff in higher education. The LUs are actively promoted through the Task Force as materials that can enhance formal, non-formal and informal adult educational settings. Figure 8 shows the early promotion of NBS EduWORLD to all NetworkNature Task Forces, demonstrating the reach to NBS institutions, organisations and ‘NBS curious’ across Europe (NetworkNature, 2024).

Figure 9. Excerpt about the Task Force from the NetworkNature Digest

Task Force 5 on education launched in January 2024, and focuses on integrating nature-based solutions at all levels of education.

Led by Trinity College Dublin on behalf of NBS EduWORLD (nbseduworld.eu), this task force has established a collaborative European network dedicated to advancing NbS education for lifelong learning. Its primary goals include fostering a community of educators, researchers, and policymakers who are committed to incorporating NbS in curricula across Europe, enhancing environmental awareness and problem-solving among students and teachers alike.

The Task Force's objectives are threefold:

Community Engagement and Outreach:

This includes creating partnerships with educational institutions and environmental organizations to raise awareness through hands-on events and workshops.

Curriculum integration:

The task force aims to embed NbS across different educational disciplines, helping students understand ecosystem interdependencies and environmental challenges.

Educational resources development:

The group produces interactive materials such as lesson plans and multimedia content to make learning about NBS accessible and engaging for a wide range of students.

We are working to build competency-focused initiatives, hoping to establish long-term changes in environmental education practices throughout Europe.

The Task Force provides funding opportunities for our members to create educational resources. Recent funding initiatives run through the Task Force are leading to novel education material and approaches being developed.

If you would like to join the conversation, become a member, or just to find out more please get in touch with our Taskforce Lead - Dr. Conor Dowling (conor.dowling@tcd.ie).

4.3. Summary of Key Findings

NBS EduWORLD created 50 modular LUs covering the full NBS lifecycle, from concept development to implementation and evaluation. These units were designed for diverse audiences, including higher education, vocational training, professional development, schools, and community learning. The approach emphasised active, outcomes-based learning and adaptability to local contexts.

Pilot testing was carried out across a range of sites, using workshops, focus groups, and direct classroom delivery. Feedback confirmed the flexibility and applicability of the LUs, with examples of successful integration into existing courses and adaptation for specific learner

groups. Testing also identified areas requiring improvement, such as thematic gaps, context specific tailoring, and the need for more trained professionals and informed decision-makers.

Collaboration with partners, including from Tier 1 demonstrators, pilot sites, and thematic networks like NetworkNature, proved essential in refining materials and extending their reach. Promotion through the NetworkNature Task Force on NBS Education increased awareness among educators, researchers, and practitioners.

Overall, the piloting phase demonstrated that the LUs are a valuable resource for embedding NBS in education but require ongoing refinement and targeted dissemination to maximise impact.

4.4. Final Recommendations: Exploring the Potential for NBS Education

The results of the pilot phase indicate that the LUs can serve as a strategic tool for embedding NBS knowledge and skills across a broad range of educational and professional sectors. Future work should focus on integrating the LUs into higher education curricula, vocational training pathways, and professional development programmes, ensuring that they are accessible to different audiences and aligned with sector specific needs. Feedback from the pilots should be used to address thematic and contextual gaps, adapting content to reflect local realities and emerging priorities within NBS practice. Strengthening the capacity of educators is also essential, with dedicated training and support enabling instructors to deliver NBS content confidently and effectively. To ensure their long-term impact, it is also essential to maintain their accessibility and visibility beyond the current commitment to 2027.

Partnerships will remain central to expanding the reach and impact of the LUs. Continued collaboration between educational institutions, policy makers, industry stakeholders, and community organisations will help ensure the materials remain relevant, up to date, and informed by real world challenges. Platforms, such as the Task Force, should be further leveraged to promote the LUs, encourage knowledge exchange, and connect with the wider NBS community. Ongoing evaluation and monitoring of learning outcomes will be important for capturing the practical impacts of NBS education, while examples from the pilot phase can serve as models for scaling and replicating the approach in different contexts. By maintaining this cycle of integration, adaptation, and dissemination, the potential of NBS education to build capacity and drive positive environmental and social outcomes can be fully achieved.

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6. Appendices

List of 50 Learning Units

	Learning Unit Title	Theme	Context	NFQ	Partner
1	Understanding Nature-Based Solutions: An Introduction	Common	All	7	TCD
2	Harnessing Natural Processes for Climate Change Mitigation	Common	All	7	TCD
3	The Role of Nature in SDGs	Common	All	7	TCD
4	Ecosystem Services and Nature's Benefits	Common	All	7	TCD
5	Exploring Biodiversity and Conservation Strategies	Common	All	8	TCD
6	Urban Green Spaces: Enhancing Cities through Nature-Based Solutions	Common	Urban	8	TCD
7	Restoration Ecology: Healing Landscapes with Nature	Common	Rural	8	TCD
8	Tools to analyse NBS understanding	Common	All	8	TCD
9	NBS and community engagement	Common	All	8	TCD
10	Implementing Nature-Based Solutions	3rd Level	All	8	TCD
11	Policy and Governance Frameworks for NBS in Europe	3rd Level	All	8	TCD
12	Nature-Inspired Design: Planning a field trip	3rd Level	All	8	TCD
13	Social Inclusion and NBS	3rd Level	All	8	TCD
14	Socio-Economic Impacts of NBS	3rd Level	All	8	TCD
15	Rewilding and Biodiversity Conservation with NBS	3rd Level	All	8	TCD
16	Enhancing health and wellbeing through NBS	3rd Level	All	8	TCD
17	Future of NBS in Cities	3rd Level	Urban	8	TCD
18	Green Finance	3rd Level	All	8	TCD
19	In and Out Lab	3rd Level	All	8	TCD
20	"What is a Nature-Based Enterprise?"	Entrepreneurial	All	7	HNUA
21	Business Models for Nature-Based Enterprises	Entrepreneurial	All	7	HNUA
22	Financing NBS	Entrepreneurial	All	7	HNUA
23	Governance and Stakeholder Engagement for NBS	Entrepreneurial	All	7	HNUA
24	Measuring Impact: how and why should NBEs measure impact	Entrepreneurial	All	7	HNUA
25	Communication and Marketing for NBEs	Entrepreneurial	All	7	HNUA
26	Agriculture based NBS entrepreneurship	Entrepreneurial	Rural	7	HNUA
27	Forestry based NBS entrepreneurship	Entrepreneurial	Rural	7	HNUA
28	Water based NBS entrepreneurship	Entrepreneurial	Coastal	7	HNUA
29	City based NBS entrepreneurship	Entrepreneurial	Urban	7	HNUA
30	Creating Sustainable Learning Spaces through NBS - Opportunities for Policy Action	Vocational	All	7	PPMI
31	Inter-sectoral collaboration and partnerships for NBS	Vocational	All	6	PPMI
32	Public procurement for NBS	Vocational	All	6	PPMI
33	NBS Community Project Management	Vocational	All	6	PPMI
34	Multi-level Governance: Bridging High-Level Strategies with Local Action for NBS	Vocational	All	6	PPMI
35	Applied Learning Seminar I: Join and explore waste water treatment NBS	Vocational	All	6	ICLEI
36	Applied Learning Seminar II: Prioritise, Commit and Plan NBS	Vocational	All	6	ICLEI
37	Applied Learning Seminar III: Implement NBS	Vocational	All	6	ICLEI
38	Applied Learning Seminar IV: Monitor NBS	Vocational	All	6	ICLEI
39	Applied Learning Seminar V: Upscale NBS	Vocational	All	6	ICLEI
40	NBS Case Study: Seaweed Farming	Common: Case Study	Coastal	8	TCD
41	NBS Case Study: SUDS	Common: Case Study	Urban	8	TCD
42	NBS Case Study: Pocket Parks	Common: Case Study	Urban	8	TCD
43	NBS Case Study: Dune restoration	Common: Case Study	Coastal	8	TCD
44	NBS Case Study: Water and bog management	Common: Case Study	Rural	8	TCD
45	Workshop I: Planning NBS Co-Production	Common: Workshop	Urban	7	TCD
46	Workshop II: NBS Delivery	Common: Workshop	Coastal	7	TCD
47	Workshop III: NBS Stewardship	Common: Workshop	Rural	8	TCD
48	Future of NBS	Common	All	8	TCD
49	Skill for NBS	Common	All	8	TCD
50	NBS in Review	Common	All	7	TCD

Project partners

NBS EduWORLD

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