Connecting with The Deep: Lifelong Learning (LLL) and Marine Sustainability

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Abstract This chapter frames marine sustainability within ongoing global and regional initiatives in lifelong learning and adult education. The authors of this chapter argue that to achieve the ambitious targets set out in the SDGs, our adult population must be able to recognise, engage with, and act upon economic, social, and environmental challenges. The authors of this chapter present the many barriers that adult learners experience and acknowledge the challenges of participation in non-formal education. We review current research into how we can effectively use

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learning, information, and messaging and see if this can help over-come some challenges, and effectively motivate adult learners to actively participate in pro-climate action and marine sustainability. The authors present The Deep Network, an adult education initiative which brings together multidisciplinary practitioners who support adults to become ocean literate in various ways. We detail the conclusions of The Deep Network meetings and show how practitioners learnt from and with each other to build capacity in marine sustainability and adult education. We conclude by making recommendations for future practice.

1   SUSTAINABLE DEVELOPMENT AND LIFELONG LEARNING: FRAMING THE DISCUSSION

In the wake of the COVID-19 pandemic and from the midst of the climate change crisis, governments and policymakers are perhaps becoming more appreciative of the value of a well-informed adult population who are active citizens, engaged employees, critical consumers, and committed community members. Certainly, achieving buy-in at the national and ground-level for the 17 Sustainable Development Goals (SDGs) with 169 targets demands that the acquirement of knowledge, skills, and competencies does not stop when one leaves the formal, standardised education provided by a school system.

Most of the knowledge and skills we need, we learn informally with families, at work, or while socialising.[1] However, at least some of the skills and competencies required for community-level stakeholders to achieve the economic, environmental, and social sustainability outlined in the SDGs will also be learnt by means of non-formal education.[2] Non-formal education (NFE) follows a programme to achieve specific learning goals but is not formally evaluated. There are recognised interrelatedness, crossovers, and grey areas between the terms informal, non-formal, and

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[1] Jeffs, T., & Smith, M. K. (1999). The problem of 'youth' for youth work. *Youth and Policy*, 45–66.

[2] UNESCO. (1997). International Standard Classification of Education.

formal adult education, particularly in the labour market.[3] Less disputed, is that adults outside of school and formal learning environments are notoriously hard to engage (particularly through formal or non-formal education) and that NFE offers a real opportunity to change educational outcome, both for societies, and for individuals.[4]

1.1   The Challenge of Participation

Part of the challenges—and the opportunities—are the many, layered factors that determine propensity and likelihood of adult educational participation. A predisposition to autonomous motivation has been shown to drive individuals to complete non-formal programmes,[5] yet recent research on adult education systems as a whole is starting to suggest that this motivation may not just come from within, but maybe a self-perpetuating socioeconomic cycle. Despite a highly developed adult education system, a recent U.S. study showed that 90% of adults aged 20 years and older considered the least educated were those who had not recently participated in formal or non-formal education. Determining factors of participation in this study, as in others, were situational reasons (e.g., increased age, low income), psychological reasons (e.g., low social trust, difficulties in connecting with new ideas), and institutional reasons (e.g., unaffordable fees).[6]

These and numerous other studies tell us that transversal factors continue to have a strong influence on adult education participation. The Incheon Declaration and Framework for Action for the implementation of Sustainable Development Goal 4 sets out in the Education 2030 Agenda[7] to ensure inclusive and equitable quality education and promote

[3] Cameron, R., & Harrison, J. L. (2012). The interrelatedness of formal, non-formal and informal learning: Evidence from labour market program participants. *Australian Journal of Adult Learning*, 52.

[4] Romi, S., & Schmida, M. (2009). Non-formal education: A major educational force in the postmodern era. *Cambridge Journal of Education, 39*(2), 257–273.

[5] Rothes, A., Lemos, M. S., & Gonçalves, T. (2017). Motivational profiles of adult learners. *Adult Education Quarterly, 67*, 3–29. http://doi.org/10.1177/0741713616669588.

[6] Patterson, M. B. (2018). The forgotten 90%: Adult nonparticipation in education. *Adult Education Quarterly, 68*, 41–62. http://doi.org/10.1177/0741713617731810.

[7] Council Resolution on a strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021–2030)

lifelong learning opportunities for all, highlighting that significant gender gaps continue to exist in many educational settings with regard to access, achievement, and uptake. Studies like Boeren's remind us that even when women and men pick up educational opportunities at the same participation rate, psychological and societal factors influence the skills and competencies learnt.[8] For example, this research found that the subjects men choose to study in their NFE are more likely to benefit from their participation in the labour market, while women are more likely to learn skills for the household.[9] Similarly, other demographics are known to experience further barriers to participation in adult education, including migrants, refuges, and the elderly, as well as accessing closed groups such as adults in detention or in long-term care settings. Fortunately, new teaching and learning approaches, such as online learning, are helping to mitigate these barriers from adults accessing non-formal education. While access to digital educational initiatives have the capacity to level some of these barriers, reviews of adult learners participating in online distance education demonstrate that common challenges are still faced by those accessing non-formal courses, depending on their age, gender, knowledge, and skills,[10] and situational tensions (where and when to study, and how to fit this around work and family) still remain.[11]

1.2   *A Transversal Commitment to Adult Education Rights, Resources, and Standards*

National and local governments have recognised the opportunities (and challenges) of NFE, both as a stand-alone response to SDG 4, but also necessary to provide society with the skills, competencies, and knowledge required to work towards the specific targets and goals of the SDGs and

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2021/C 66/01. https://op.europa.eu/en/publication-detail/-/publication/b004d247-77d4-11eb-9ac9-01aa75ed71a1.

[8] Boeren, E. (2011). Gender differences in formal, non-formal and informal adult learning. *Studies in Continuing Education, 33*(3), 333–346.

[9] Ibid. (see footnote 7).

[10] Kara, M., Erdogdu, F., Kokoç, M., & Cagiltay, K. (2019). Challenges faced by adult learners in online distance education: A literature review. *Open Praxis, 11*(1), 5–22.

[11] Selwyn, N. (2011). 'Finding an appropriate fit for me': Examining the (in) flexibilities of international distance learning. *International Journal of Lifelong Education, 30*(3), 367–383.

achieve sustainable development. Beyond SDG 4, education—particularly non-formal, informal, and lifelong learning—is inherently linked to the success of other SDGs and is marked as a transversal commitment across five other SDGs (SDG 13 Climate action, SDG 14 Life below water, SDG 5 Gender equality, and SDG 15 Life on land). Further, improving access to quality education in various contexts is central to the global partnership targets of Goal 17. Education, especially adult education, plays a crucial role in achieving this goal by promoting capacity-building, knowledge-sharing, and fostering collaboration among countries, organisations, and individuals.

The global partnership for improving adult learning and education was recently solidified at the Seventh International Conference on Adult Education on 17 June 2022 where the Marrakech Framework for Action was adopted. Representatives of over 140 countries came together in a commitment to translate the vision of a right to lifelong learning into reality. Each country committed to significantly increasing adult participation in learning and recognised the need for increased financial investment in adult learning and education. In the European Union (EU), lack of participation in adult learning has been identified as a work focus of the European Education Area for the period 2021–2030,[12] so that international initiatives like the Marrakech Framework fit into an existing and longstanding EU commitment to the right to education, training, and lifelong learning, as enshrined in the European Pillar of Social Rights (principle 1). UNESCO Institute for Lifelong Learning[13] has also been working for decades to build capacity, networks, and awareness in lifelong learning, particularly as these align with global challenges.

[12] The European Pillar of Social Rights in 20 principles. https://ec.europa.eu/social/main.jsp?catId=1606&langId=en, last access December 2023.

[13] UNESCO Institute Lifelong Learning. https://www.uil.unesco.org/en/, last access December 2023.

2   WHAT DO ADULTS NEED TO LEARN ABOUT THE OCEAN, AND DOES PARTICIPATION IN LEARNING CHANGE OUR BEHAVIOUR?

In making these commitments to improve access to resources and training for adult education and lifelong learning, a focus on the climate and the connection between human activity and environmental degradation is important when considering the knowledge, skills, and capacities needed to reach a truly sustainable society. However, at the government level, it is acknowledged that simply knowing that human actions will have a negative consequence on the environment is not enough to actually change our behaviour.

In fact, pro-environmental thoughts and behaviours are weakly linked, and we tend to be surprisingly inaccurate about the environmental impact of our everyday actions.[14] The importance of our seas and oceans has been increasingly recognised in recent years by people who strive to understand climate change and the role humans play. However, the high seas—the waters situated beyond the border of any one country conceptualised as a common-pool resource without clear property rights—can be more difficult for stakeholders to invest in and connect to. Decades of monitoring sustainability policies in common-pool resources have demonstrated that the policies used until now are only effective when they fit with the local culture and institutional environments of those who depend on ecosystems for their livelihood.[15]

Still, despite advances in Education for Sustainable Development (ESD),[16] climate change in general and marine sustainability in particular are not standard among the core curriculum for European students. Indeed there is some evidence that marine education is among the most marginalised in formal school education.[17] As adult learners and teachers,

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[14] Wyss, A. M., Berger, S., & Knoch, D. (2023). Pro-environmental behavior in a common-resource dilemma: The role of beliefs. *Journal of Environmental Psychology, 92*. http://doi.org/10.1016/j.jenvp.2023.102160.

[15] Ostrom, E. (2008). The challenge of common-pool resources. *Environment: Science and Policy for Sustainable Development, 50*(4), 8–21.

[16] What you need to know about education for sustainable development. https://www.unesco.org/en/education-sustainable-development/need-know.

[17] Gough, I. (2017). *Heat, greed and human need: Climate change, capitalism and sustainable wellbeing.* Edward Elgar Publishing.

most of us are under-informed not only on how important the seas and oceans are to achieve climate goals but also on what that means to us and what we can do about it. Even tools to ascertain how much we know—such as The Blue Survey of Ocean Literacy Among Adults—are in their infancy.[18] Yet few studies have been conducted on community marine education showing a more positive attitude towards this common resource, in addition to greater compliance with measures put in place to protect it.[19]

Finally, we review what the UNESCO Institute for Lifelong Learning (UIL) has already put in place to strengthen the capacities of Member States to build effective and inclusive lifelong learning policies and systems, in line with SDG 4.

2.1   Climate Change and Altering Human Activity: Current Research

The authors have already noted the extent to which identifying behaviours, and demographic or psychological differences make a difference to adults' participation in education. In this section, we move on to highlight the recent studies that could inform decision-makers, educators, and scientists to predict how a specific sustainability message will make an impact, therefore helping educators to become more effective in designing education and communication to promote climate-positive beliefs and actions. We go on to note that studies show that being close to nature helps promote empathy and action and that communication and sharing of experience is a powerful means for change. Finally, we respond to the question: when we are designing educational initiatives for adults, how can we use all dimensions of learning and engagement to evoke change?

Without the benefit of a curriculum, encouraging adult climate action requires adjusting communication techniques and creating different "entry points" to fit each audience. Surveys are good tools to determine

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[18] Paredes Coral, E., Deprez, T., Mokos, M., Vanreusel, A., & Roose, H. (2022). The Blue Survey: Validation of an instrument to measure ocean literacy among adults. *Mediterranean Marine Science, 23*(2), 321–326.

[19] Leisher, C., Mangubhai, S., Hess, S., Widodo, H., Soekirman, T., Tjoe, S., … Sanjayan, M. (2012). Measuring the benefits and costs of community education and outreach in marine protected areas. *Marine Policy, 36*(5), 1005–1011.

the overall behaviour and attitudes of a population while simultaneously collecting data on relevant information like demographics and political preferences.[20] Currently, it seems that there is not much known about the ocean among the general adult population, and many adults outside of the scientific community are not aware to what extent the ocean's role is in climate change.[21] In a recent study by Kácha et al.,[22] it was found that 42% of European adults were "indifferent" to climate-change-related issues ($n = 22,189$), signifying that they had low belief, concern and motivation in regard to taking action to mitigate the impacts of climate change. Although they are not denying it, a large proportion of the population admits to not acknowledging and/or even thinking about the issue.

If we, as a society, are to achieve the ambitious sustainable development goals and improve social, economic, and environmental outcomes for all, we need to develop strategic, engaging ways to improve ocean literacy (and ecological literacy in general) among adult learners to move this 42% of the unmotivated population into a more participatory role in a sustainable society. Grund and Brock found that one of the main approaches to shifting mindsets leading to sustainable behaviour and attitudes is fostering a connection to nature. If we feel connected to something and care about it, there is an increased likelihood that we will want to protect it—linking our actions directly to our emotions.[23] This important connection between action (behavioural) and emotion (emotional) has been recognised by the United Nations Educational, Scientific and

[20] Calculli, C., D'Uggento, A. M., Labarile, A., & Ribecco, N. (2021). Evaluating people's awareness about climate changes and environmental issues: A case study. *Journal of Cleaner Production, 324*, 129244.

[21] Cooley, S. R., Bello, B., Bodansky, D., Mansell, A., Merkl, A., Purvis, N., … Leonard, G. H. (2019). Overlooked ocean strategies to address climate change. *Global Environmental Change, 59*, 101968.

[22] Kácha, O., Vintr, J., & Brick, C. (2022). Four Europes: Climate change beliefs and attitudes predict behavior and policy preferences using a latent class analysis on 23 countries. *Journal of Environmental Psychology, 81*, 101815.

[23] Grund, J., & Brock, A. (2020). Education for sustainable development in Germany: Not just desired but also effective for transformative action. *Sustainability, 12*(7), 2838.

Cultural Organization (UNESCO)[24] as part of the three different dimensions of learning for ESD: cognitive (understanding challenges and information presented), behavioural (ability to take practical action), and social and emotional (building core values and attitudes, cultivating empathy and passion for humanity and the planet). However, the information presented for ESD falls heavily on the cognitive dimension of learning at 48%, with the behavioural dimension and the emotional dimension falling behind at 27% and 23%, respectively. Levelling out these different dimensions of learning by incorporating the behavioural and emotional components into adult education, especially on topics such as the ocean and climate change, promises transformative change in the uptake of information, with new ways of understanding challenges and transforming core beliefs and values around the environment. Then, consequently, ESD would move beyond the cognitive dimension of learning towards the emotional dimension that leads to increased participation, structural changes, and new opportunities for action.[25]

Thus, in designing educational initiatives for adults, we must find a balance between all learning dimensions to evoke change in a person's attitude and behaviour in relation to the environment. Regardless of the project, or specific target group, these dimensions and recommendations should be taken into consideration when designing curriculum and programmes for adult and lifelong learning opportunities. The responsibility to bring these emotional and behavioural dimensions into the learning lies in the hands of those providing the information (i.e., scientists, educators, policymakers), however, it is more effective when these stakeholders collaborate with practitioners in other disciplines to exchange knowledge and experience on who should be educated, where and how the learning takes place, and with what ocean literacy goals in mind. It is within this multidisciplinary space for shared exchange that The Deep Network project came to be. The overall objective of The Deep Network project is to share ocean-relevant information and collaborate across disciplines with a common aim to improve the accessibility and uptake of information among the lay adult audience and to nudge this 42% of the indifferent adult population into marine sustainability action.

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[24] UNESCO. (2020). Education for sustainable development: A roadmap. http://doi.org/10.54675/YFRE1448.

[25] UNESCO. (2020). Education for sustainable development: A roadmap. http://doi.org/10.54675/YFRE1448.

In the following sections we will outline how The Deep Network partners curated and shared responsibility for this exchange with network members.

3   CONNECTING MARINE SUSTAINABILITY WITH SDG 4 IN PRACTICE: THE DEEP NETWORK, A PATHWAY TO PROMOTE CHANGE

Within the context of the SDG framework, its commitment towards improving education, and recent research regarding climate change messaging, this section provides an outline of the approach taken by The Deep Network to bridge the gap between marine science, marine sustainability, and adult education.

The Deep Network is an informal and open collaboration between marine researchers, educators, and activists comprised of over 40 active participants from more than 10 countries who meet regularly to present educational initiatives, develop new partnerships, and curate an online library of inspiring practice. We will go through the results of our first three network meetings, including the peer learning and mutual understanding which has taken place between the different disciplines. Finally, we will outline next steps for the network.

The aim of The Deep Network project is to put into practice this shift towards engaging non-formal learners to go beyond learning and begin participating in pro-climate action. To accomplish this The Deep Network is founded on a need to understand the needs and interests of adult learners, and formulate learning objectives based on this. The key to developing the right teaching methods, materials, and resources is to evaluate the learning experience and assess the need for continued learning based on what has been presented.[26] By building an interdisciplinary network of adult educators, ocean scientists, activists, and members within the ocean tourism branch, The Deep Network brings together stakeholders and provides a space for a cross-sectional exchange of information for exactly this purpose. One of the benefits of working in interdisciplinary groups is the sharing of new knowledge that broadens the perspective

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[26] Blondy, L. C. (2007). Evaluation and application of andragogical assumptions to the adult online learning environment. *Journal of Interactive Online Learning, 6*(2), 116–130.

and opens the conversation to more creative and innovative approaches to addressing a problem.[27]

The initial phase of The Deep Network's commitment to lessening the gap in ocean literacy consisted of three interactive online sessions attended by marine researchers, educators, and scholars interested in addressing three different topics: (1) develop a learner profile, (2) determine what learning methods work best, and (3) how to tell if there has been behavioural change (Fig. 1). The experience and feedback of the hub meetings confirms the notion that many of societies challenges go beyond the boundaries of one discipline and that we can learn valuable skills of communication for both academic and non-academic audiences.[28]

During The Deep Network Hub meetings, there were interactive group discussions on different educational initiatives presented by the participants that provided various examples of how to approaching improving ocean literacy among adult learners. Overarching consensus in post-meeting evaluations showed that learning about the different types
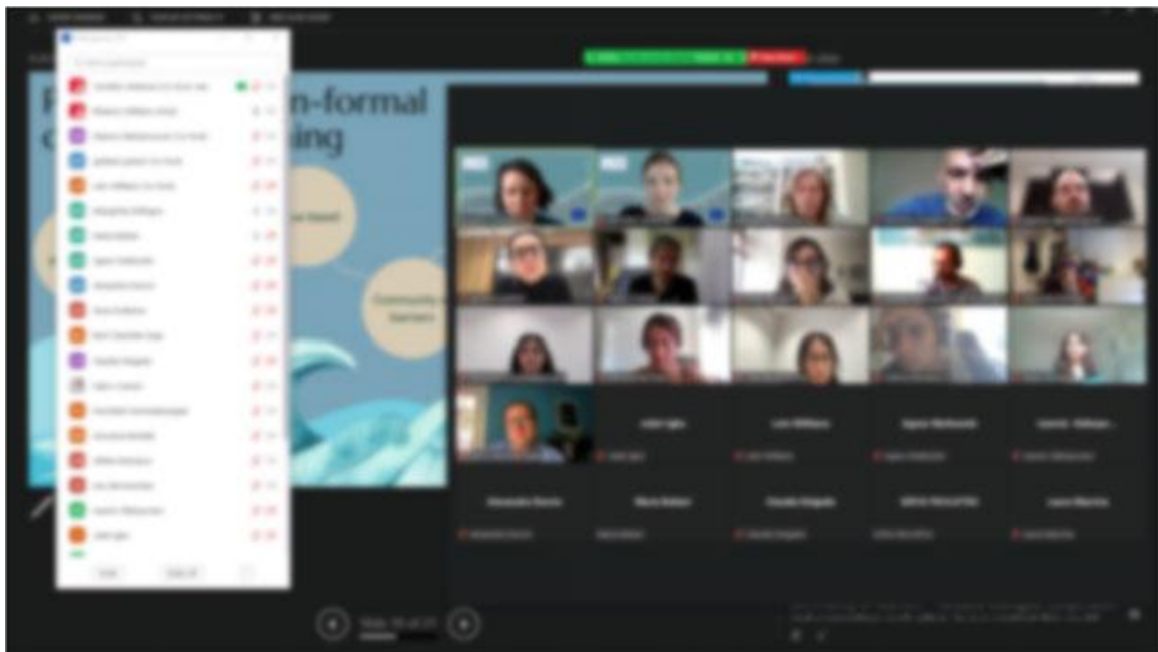
Fig. 1 A screenshot of The Deep Network Hub Meeting. Image has been blurred out of respect for data protection and privacy of participants

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[27] Fitzgerald, D., & Callard, F. (2015). Social science and neuroscience beyond interdisciplinarity: Experimental entanglements. *Theory, Culture & Society, 32*(1), 3–32.

[28] Ibid. (see footnote 27).
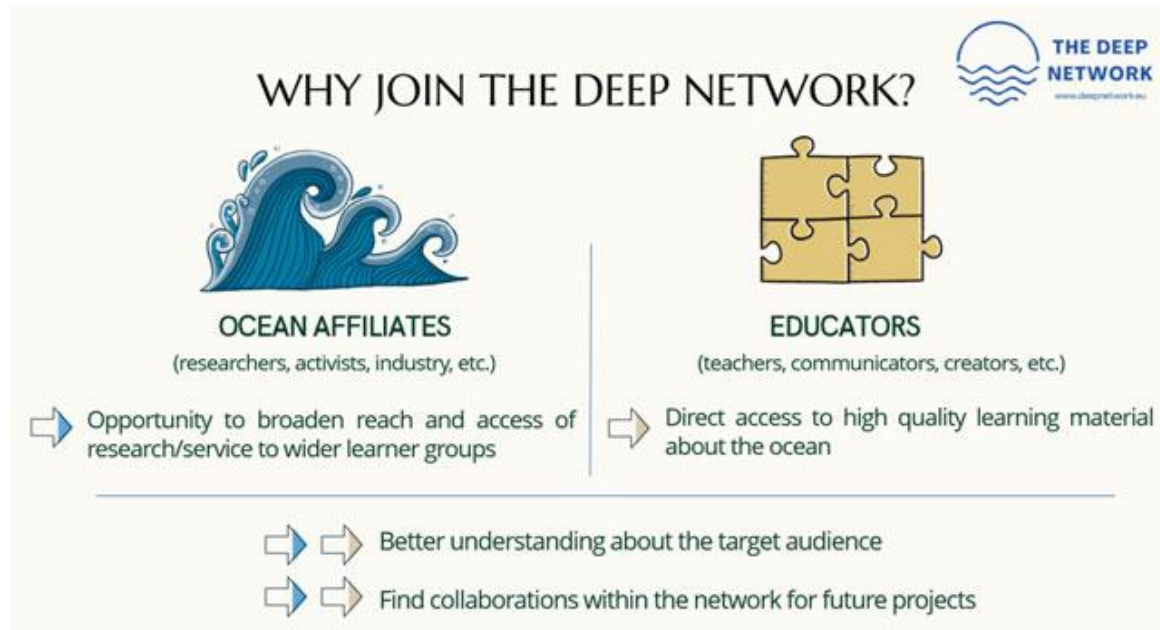
Fig. 2 The benefits for both ocean affiliates and educators for being a part of The Deep Network

of initiatives was inspiring and gave participants hope and motivation to continue developing much needed educative materials for adult learners. This is also a strong motivator for participants to use The Deep Network as a springboard for future interdisciplinary collaborations. Figure 2 highlights the benefits of The Deep Network for its members. In the following sections, we will outline the results of each of the meetings, and how the peer learning and mutual understanding has taken place between the different disciplines.

3.1   Deep Network Hub 1: Profiling the Ocean Literate Adult

The first Hub meeting was held on 3rd June 2023. It was attended by 29 multidisciplinary participants from marine research institutes, marine conservation initiatives, non-profit organisations working to increase marine awareness, cruise ship community outreach and adult education practitioners. To start, participants were asked to define "responsibility". We developed a common understanding of responsibility as awareness of the consequences of one's own actions on others. This awareness, however, is not passive and requires "taking charge" and acting, based on what you know and how you define your role. Additionally, participants

noted that responsibility also has a legal definition in terms of obligation, as a moral or legal duty that requires us to act, with potential penalties for the failure to do so. With this definition of responsibility in mind, participants were broken down into three smaller break-out groups to draw the profile, barriers, and opportunities for adults to learn about the ocean, as well as specific learning outcomes.

Adult learners were categorised into three different groups: young adults, adults/families, and older adults. For each group we discussed how they may access learning, what could be a barrier, and what would be needed to support them in accessing quality information about the ocean. Since the majority of participants had themselves run ocean literacy initiatives, they shared practical information about what had worked with these particular beneficiaries:

- **The young adult group** identified social media as the primary information source. **Young adult barriers to learning** included were largely considered to be psychological, such as the large spatial and long-time scales upon which science works which makes it challenging to compact all the research into a 30-second reel. **Ways to support young adult learners** include making learning fun and make use of technology through virtual reality, gamification, or interactive learning platforms.
- **The adults/families group** also considered that social media is a main artery for information, but supplemented with documentaries, lifelong learning initiatives, and online courses. **Barriers for adults/ families** identified by this group included lack of interest, lack of time, motivation, work overload, and family obligations. **Ways to support adults and families** included focusing on developing scientifically accurate visuals that are quick to read and easy to understand, and incorporating science information booths at local community events.
- **The older adult group** was profiled to access information mostly through mainstream media, magazines, or newspaper articles. Here the barriers that could be faced by this group included misinformation, limited access to high-quality learning material and the idea that economic benefits are "more important" than long-term conservation. Solutions to support this group include promoting a

friendly EU policy on tourism; provide more educational opportunities specifically for older adults and to use role models in social media ads.

Common learning barriers for all three groups, and what continues to be one of the most challenging aspects of science communication, is the challenge of presenting information in a way that it is pertinent to their individual lives: "If doesn't affect me, why should I care!?".

With this basic profiling activity behind us, each break-out group was given a different topic to explore (sea floor, ocean, and tourism) in more detail. Participants were asked to put themselves in the place of non-scientist adult learners and answer the questions of: Why do I need to know about this topic, what pre (or mis) conception might I have about this, and why do I need to take responsibility?

We noted that responses to the first question could also address the "why should I care?" mentality which had been a common barrier to learning identified in our profiling activity. Interestingly, for all three topics, the misconceptions about the ocean were generally the same: that the ocean will always be there for us, and that it can take care of/clean itself.

For the final activity in the first Deep Network Hub, we asked participants to list what type of skills would be necessary for adult learners to successfully make a change in their behaviour after learning about the ocean. The broad responses participants gave covered media literacy, active citizenship, community network, critical thinking, time management, decision-making skills, and communication skills.

Conclusions for Deep Network Hub 1 We reach a consensus on the different barriers to ocean literacy, and the most effective methods of making ocean information available to different adult learners' age groups. We agreed that these should be well defined, according to the type of educational initiative. All practitioners stressed that relevancy to the beneficiary is central to the impact on them, and to the success of the initiative.

3.2   The Deep Network Hub 2: Effective Educational Methodologies for the Ocean Literate Adult

The second Hub meeting was held on 1st September 2023, and focused on the best method of learning that should be used, and to determine exactly what themes would be most important and relevant to the adult learner. Participants first agreed on which front-line organisations could support in disseminating an education-based call-to-action. They proposed non-profit organisations, local museums, universities, recreational businesses/organisations (scuba diving clubs, sailing clubs, tour boat operators, etc.), ocean literacy programmes, and social media influencers. We went on to discuss how educational initiatives should be delivered, dividing at this point into two groups where practitioners shared inspiring practice in hands-on, and hands-off activities:

- **Hands-on activities** proposed were in-person courses, workshops, and exhibitions at universities or museums to engage people's emotions, multi-sensory activities such as beach clean-ups and coral plantings, 4-sensory stimulations on tourism tours, interdisciplinary conferences.
- **Hands-off activities** proposed were social media campaigns, gamification, online courses, documentaries, live streaming from scientific expeditions, visualisations of local underwater species with simple—jargon-free—information.

Finally, we used an interactive online whiteboard (JAMBOARD Fig. 3) to characterise what people need to know into four groups:

1. Biodiversity—people need to understand the importance of biodiversity and how each organism in the ecosystem has a specific role and is dependent on the other.
2. Human health—people should not underestimate the benefits of the sea on one's physical and mental health.
3. Economic and cultural significance—many communities depend on the services from the ocean for their livelihood, we need people to know that these communities are being threatened because of human impacts on the ocean.
4. Human impact on the ocean—there needs to be a realistic conversation about the consequences our impact is having on the ocean,
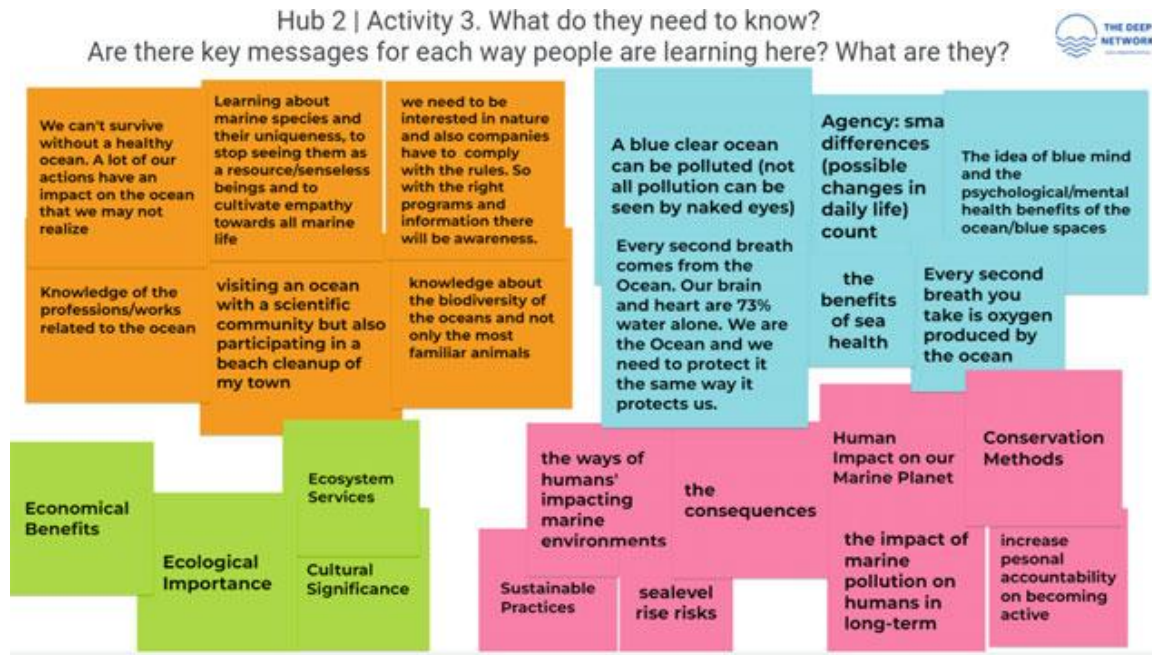
Fig. 3 Jamboard interactive discussion notes for Hub meeting 2, activity 3. "What they need to know" could be characterised into 4 main groups: Biodiversity (orange), Human health (blue), Economic and cultural significance (green), and Human impacts on the ocean (pink)

juxtaposed with mitigating solutions including the importance of sustainable practices, conservation methods, marine protected areas, etc.

Conclusions for Deep Network Hub 2: Alongside concrete conclusions on educational methodologies for adult learners, this hub meeting ended in an inspiring and open space where participants shared related to organisations, projects, or research that is already active in these areas or working towards this goal.

3.3   The Deep Network Hub 3: Assessing the Ocean Literate Adult

The third Hub meeting was the final in this series, and was held on 3rd November 2023. The goal of this meeting was to share methods to evaluate behavioural change in adult learners who have engaged with ocean literacy content. To set the stage, we presented some data about Europe-wide attitudes towards climate change and discussed the three dimensions of learning outlined by UNESCO (2020). We asked participants if they

had examples from their own experiences about how they may have changed the behaviour or attitudes of their target groups. These answers could be categorised into 3 groups: (1) Interacting directly with non-scientific groups and getting real-time feedback through engagement, discussion, or questionnaires; (2) Education, with a focus on how children can influence the mindset of their adults; (3) Social media campaigns with engagement and positive feedback.

Participants reached a consensus that the most effective way to actually evaluate whether or not the messaging has been received and acted upon by the target group would be to have people fill out initial evaluations, and then have a re-evaluation at a later date. Some solutions about how to actually implement this included having groups on WhatsApp or monthly meet-ups to hold each other accountable, and to implement surveys into any activity, whether it be gaming, an online course, webinar, or monthly challenges (i.e., Plastic-free July) directly after the event and then a follow-up survey sometime later. This way survey results can be compared to qualitatively see if there is a difference in a person's behaviour and/or attitude. This does bring more responsibility on the parties developing and disseminating the information, and requires more resources to implement evaluation methods. However, these results were considered by participants as key to determining whether or not the methods were really effective, and for evidencing this effectiveness to funders and stakeholders.

4   Concluding Remarks

SDGs provide relevance, accountability, and a connection to a global community: Using frameworks such as those provided by the SDGs are an opportunity for educators, marine scientists, and policymakers to create greater trust and accountability in their initiatives. In communicating the SDG that you align with as part of your strategy, you can show adults beneficiaries that they are part of a global movement for change in the biggest societal, economic, and environmental challenges of our times.

Research your local, regional, and national initiatives in lifelong learning and non-formal adult education: Non-formal adult education is becoming of greater value. If you are beginning, or building, an initiative, look to see what your regional and national resources and advocacy for adult learners and adult educators is, and whether you can link into existing networks, funding or training pathways. When you communicate with funders, policymakers, and stakeholders in education, remember to

stress that marine-literate, proactive communities are not just nice to have; they are also proven to be more compliant with sustainable development policies.

Build capacity—and multidisciplinary partnerships—in adult education methods and skills: In The Deep Network we introduced our members to some basic tools for NFE, such as learning needs analysis, learner profiling, setting relevant learning objectives, and consistent use of learning assessment methods. We strongly recommend that if you are building on or designing a new initiative for ocean literacy, your organisation either teams up with other practitioners who specialise in adult education, or you build your own capacity in-house. Particularly assessment and feedback methods, firstly so that you can monitor and improve your initiative, and ensure it remains relevant, and secondly so that you can provide evidence of its effectiveness to stakeholders and funders.

Educators use specific methodologies to produce compelling narratives that underscore the oceans' significance and marine sustainability using established communication techniques (some of which we showcase in The Deep Network) and incorporating recent research findings on effective climate change messaging. Very often, practical examples and case studies are the successful approaches that resonate with diverse adult audiences, so curating past and present initiatives is important to inspire new ones.

Build a network of local knowledge: Take the plunge and try out The Deep Network method in your local context. Set up your own short, informal meetings of marine sustainability champions. Ask a broad range of people with scientific, consumer, community, environmental and educational knowledge of the ocean, and provide a space for them to learn from and with each other, and for new collaborations to thrive. Alternatively, join The Deep Network—our doors are always open!

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