# Collective impact for ocean literacy – inspiring the next generation of ocean champions using social marketing

Patricia McHugh
*Marketing Discipline, J.E. Cairnes School of Business and Economics,
University of Galway, Galway, Ireland*

Cushla Dromgool-Regan
*Camden Education, Galway, Ireland*

Christine T. Domegan
*Marketing Discipline, J.E. Cairnes School of Business and Economics,
University of Galway, Galway, Ireland, and*

Noirin Burke
*Galway Atlantaquaria, Galway, Ireland*

## Abstract

**Purpose** – This paper aims to describe a case between practitioners and social marketing academics to grow and scale a programme that engages with primary schools, teachers, children and the education network, inspiring students to become marine leaders and ocean champions.

**Design/methodology/approach** – Over a six-year period, the authors first applied collective intelligence to work with stakeholders across society to better understand the barriers and solutions to teaching children (6–12 year olds) about the ocean in schools. Following this, a Collective Impact Assessment of the Explorers Education Programme took place to grow the impact of the programme.

**Findings** – The Explorers Education Programme has grown its numbers higher than pre-pandemic levels. In 2022, the Explorers Education Programme had the largest number of participating children, reaching 15,237, with a growth of 21% compared to pre-pandemic levels in 2019 and 79% compared to

2021. In 2023, the programme won the "Best Education Outreach Award" category of the Education Awards in Ireland.

**Research limitations/implications** – This research stresses the importance of measuring impact. The long-term impact of the Explorers Education Programme at societal, environmental and economical levels takes a much longer time frame to measure than the six years of these research collaborations.

**Practical implications** – The collaborative approach between academics and practitioners meant that this research had practical implications, whereby necessary and effective changes and learnings could be directly applied to the Explorers Education Programme in real time, as the practitioners involved were directly responsible for the management and coordination of the programme.

**Originality/value** – The value of collaborations and engagement between academia and practice cannot be underestimated. The ability to collectively reflect and assess impact moves beyond "an" intervention, allowing for more meaningful behavioural, social and system changes for the collective good, inspiring the next generation of marine leaders and ocean champions.

**Keywords** Impact, Stakeholder engagement, Social marketing, Collective intelligence, Collective Impact Assessment, Ocean literacy

**Paper type** Research paper

## 1. Background, problem generation and impact to be achieved

Ocean literacy is defined as an understanding of the ocean's influence on you and your influence on the ocean. Although it is acknowledged that many people "rely upon the sea and its resources for their livelihood either directly or indirectly, while for others seas and coasts are important for recreation" (Hynes *et al.*, 2014, p. 57), making decisions on the marine environment and its resources can have considerable social and economic consequences. Aligning policy decisions and societal expectations to achieve a blue economy is difficult, when the number one barrier theme in addressing ocean literacy across Europe is the lack of or partial knowledge about the ocean and a lack of awareness of marine issues (Fauville *et al.*, 2018). With ocean literacy now on government agendas, marine literacy, however, remains absent from the formal primary school education curriculum in Ireland (NCCA, 2010).

Therefore, the pathway to generating a blue economy by creating an ocean literate society informally through primary school education is complex and cannot be achieved through one theoretical framework or system. Furthermore, no single person or entity has the resources or expertise to bring about lasting social change. This led to the development of the Marine Institute's Explorers Education Programme, which engages with primary schools, teachers, children and the education network, to inspire students to become marine leaders and ocean champions in Ireland. The programme introduces marine literacy in the classrooms as a topic area at an early age. For ocean literacy and the continued integration of the Explorers Education Programme in primary schools, it is important to understand the stakeholders involved, their common interests, values, attitudes and behaviours, and what is required as a community to progress towards change. Social marketing, while acknowledging that human behaviour is complex, has proven successful in influencing behavioural and social change using marketing techniques and principles. Social marketing provides an effective pathway for stakeholders at the interface of marine and educational subsystems and is one approach that can support and reinforce the societal and cultural changes needed for an ocean literate society.

This paper summarises the work of six years of collaborations and cooperation between social marketing academics and education and marine practitioners, with one of the practitioners completing a Masters by Research in Social Marketing to fully understand and apply social marketing principles and techniques to positively impact and grow the

Explorers Education Programme. We will first provide a brief overview of the first collaboration between the team which engaged with multiple stakeholders using collective intelligence (CI), to understand the barriers and co-design more effective solutions to teach 6–12 year olds about the ocean. Arising from this collaboration came a second opportunity to evaluate the Explorers Education Programme, using social marketing principles and a Collective Impact Assessment. Collective Impact considers who-to-engage with, what-to-work-on together and how-change happens on a large scale. Arising from these collaborations, 2022 witnessed the highest impact of the programme, reaching 463 modules and 15,237 children. This represents the highest numbers reached in a single year since the programme began in 2006.

## 2. Working with stakeholders

Stakeholders are at the heart of social marketing work and the emphasis of working "with" stakeholders and not "on" or "for" stakeholders is extremely important. For the Explorers Education Programme, it is much more than just communication to stakeholders, and it is an interactive process of stakeholders working together to have impact and ensure the growth and legacy of the Explorers Education Programme. The programme's priorities and goals outline the diverse and multiple stakeholder groups (see Plate 1) directly impacted:
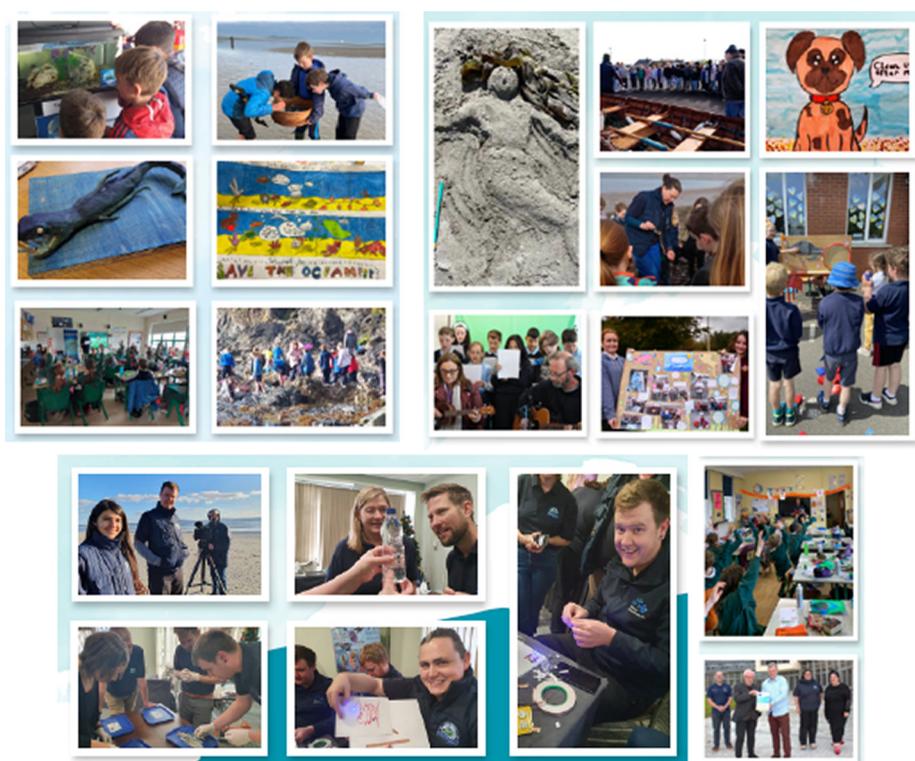


**Source:** © The Explorers Education Programme

• educate and inspire primary school children, teachers and the education network, to adopt ocean literacy concepts and principles and to support the UN Sustainable Development Goals, specifically highlighting 14 (Life Below Water), 13 (Climate Action), 12 (Responsible Consumption and Production), 6 (Clean Water and Sanitation), 4 (Quality Education) and 3 (Good Health and Well-Being). Specifically, the Explorers Education Programme offers a range of marine themed activities for primary school students and teachers in the classroom, through blended learning as well as outdoor education (see Table 1 for details);

| Activities | Description | Examples of resources |
|---|---|---|
| Aquarium in the Classroom | Provides children with an opportunity to learn about native seashore species in the classroom | • Teachers can be provided with equipment and stock to run a saltwater aquarium with native species from the seashore for up to four weeks in their classroom |
| Seashore Safari | Involves a fieldtrip to the seashore, where the children learn about marine animals, seaweeds and environmental care | • Planning guides, seashore films, fun facts, activity art sheets, a seashore guide workbook |
| Marine in Class Projects | Provides a range of cross curricular projects activities that support learning about: <br>• Marine biodiversity – animals and plants<br>• Caring for our marine environment and the impacts of litter<br>• Ocean literacy and the arts – learning about ocean legends, myths and fairy tales<br>• The Sustainable Development Goals.<br>• Marine technology – hydrothermal vents, submarines and Remotely Operated Underwater Vehicles (ROVs) | • Ocean Literacy and SDG Resources – guides, presentations, booklets, videos, ocean education wheel<br>• Deep Sea Species – the good the bad and ugly deep sea species books<br>• Learning about Squid – squid dissection film and fun facts, information books on squid, workbooks, presentations, lesson plans and activities<br>• Turtle talk with Sea Turtles – workbook, photos, infographics and fun facts<br>• Solutions to ocean pollution to support environmental awareness and care projects – workbooks, sea art construction projects, exhibitions, action board poster<br>• Ocean fact or fiction cards |
| STEM workshops | Workshops that align with maths, science and engineering weeks in the school calendar | • Education resources and lesson plans to carry out cross curricular project work based on the activities carried out at workshops which may also extend to include art activities (STEAM) |
| Healthy Ocean Project | An all-school approach where children work together on a "Healthy Ocean Project" that also engages with their local community. The project aims to inspire students to become marine leaders and ocean champions | • Handbook and learning activities |

**Source:** Authors' own work

**Table 1.**
Explorers Education Programme activities and examples of resources

- coordinate professional development training and workshops for teachers, trainee teachers and outreach teams, to develop their marine literacy skills and to promote the use of marine content in line with the national curriculum;
- develop education materials and resources that can be used to teach children about the value of Ireland's marine resource and the importance of our ocean and marine heritage, through Science, Technology, Engineering and Mathematics (STEM) and STEAM projects, cross-curricular modules, lesson plans and activities in the classroom and on the seashore. Table 1 outlines further examples of educations resources provided by the programme; and
- promote ocean literacy and marine outreach activities among local communities, educators and influencers, through events and media content to create dialogue and engagement about our ocean.

All collaborations and work with stakeholders follow a set of protocols for stakeholder participation:

(1) boundary analysis – establish primary and adjacent systems;

(2) establish an internal working group – bring together individuals with diverse and varied backgrounds and expertise to coordinate change;

(3) stakeholder identification – identify key individuals/groups who can affect or are affected by the programme;

(4) stakeholder classification – analyse and classify stakeholders based on their backgrounds, knowledge and experiences;

(5) identification of stakeholder interests and influence – identify what stakeholders are doing in relation to the programme and their levels of interest and/or power;

(6) stakeholder selection and recruitment – select and recruit a diverse stakeholder group with varied insights, competencies and aspirations; and

(7) stakeholder engagement strategy – establish the best method of engaging with selected and classified stakeholders.

More detail on these protocols can be found in a journal article by McHugh *et al.* (2018). The education and marine practitioners involved in this collaborative case have been responsible for the development, design, delivery and success of the Explorers Education Programme in Ireland since its inception. The difficulty of a long running programme like the Explorers Education Programme means there are multiple stakeholders involved at different points, continuously, over its lifetime. There are the operational everyday interactions with stakeholders to run the programme, and then there are research collaborations with other stakeholders to help improve the programme as well as assess its impact. In the case of the latter, the establishment of an internal working group is key for consistency and incremental growth. This programme is lucky in the sense that the internal working group members have not changed over the six-year period of our research/academic collaborations. This has allowed for continuity and progression, as each internal working group member is familiar with the programme, its priorities, goals and its desired future outlook and objectives.

There were two phases to the stakeholder engagement work for the internal working group in this six-year period: first, involved using CI to engage with multiple stakeholders across the marine and education subsystems to move beyond creating "an" intervention for ocean literacy; and second, undertaking a Collective Impact Assessment with the stakeholders responsible for running the Explorers Education Programme.

For the first, CI phase, we adapted the CI methodology of Warfield (1976) and Warfield and Cardenas (1994). For a detailed description on the methodology and steps involved, read journal articles by McCauley *et al.* (2019) and Fauville *et al.* (2018). CI is a methodology that facilitates group discussion and consensus building through deliberate, organised conversations. The research questions guiding Phase 1 were: "what are the barriers to teaching children (aged 6–12 years) about the ocean in primary schools?" followed by: "what are the solutions to help overcome the barriers to teaching primary school children (6–12 years) about the ocean". In social marketing, it is important to co-create solutions and action plans to move forward. Emphasising only barriers would have provided context to the problem but no pathway forward. Asking for solutions gives stakeholder time and space to navigate the future for ocean literacy and try to overcome the perceived challenges and barriers currently inhibiting the integration of marine literacy in the curriculum.

In relation to stakeholder engagement, typically in social and behavioural sciences involving educational research, the sampling frame used by researchers often focuses on the micro levels within the education system including school management and teachers, as it is considered that these have the most direct impact on students' learning. We were concerned with not only the micro level but also adjacent communities and their economic, cultural and social domains that needed to also be considered for possible or potential linkages to ocean literacy. This multilevel micro–meso–macro perspective reaffirms Layton's (2014, p. 305) perspective that issues need to consider and include stakeholders across "social, cultural, political and economic life of communities, the physical environments in which communities are located, and the historical context or legacies that each community has inherited". Figure 1 outlines the broad classification of marine and education stakeholders identified at the interface of the micro–meso–macro levels for ocean literacy. Four hundred stakeholders were invited to participate in the online consultation phase (see Appendix 1), from which 150 stakeholders agreed to participate. During this phase, it was important to have an equal representation from each level, sector and group, so non-probability sampling was used to avoid one group or level from Figure 1 dominating participation in the CI phase.

Our team gathered 450 barriers from these 150 stakeholders online and from this group, 31 participated in three face-to-face workshops to structure and map the barriers and co-design solutions for pathways forward. This CI phase highlights the importance of bringing key stakeholders at the interface of marine and education systems together, spanning teachers, educators, outreach agencies, communities, marine experts, industry, media, curriculum designers and government agencies. All have a remit for ocean advocacy and
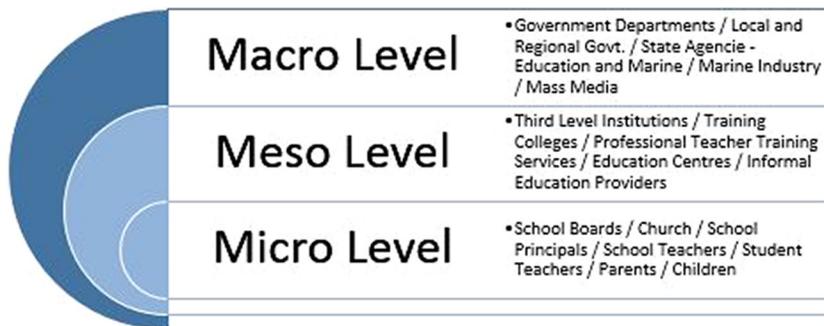


**Figure 1.**
Broad classification of marine and education stakeholders

**Source:** Authors' own work

ocean literacy and are involved in the process of navigating change for the Explorers Education Programme.

In the next phase of our work, Phase 2, we were concerned with engaging with the stakeholders responsible for running the Explorers Education Programme, to undertake a Collective Impact Assessment. To truly assess the impact of a programme, it is important to stop and reflect and see what's working well, what can be improved and what's not working. It was decided to only engage with those who are responsible for delivering the programme, as there is an extensive network of service providers across the country with this remit. Speaking to schools, teachers and children was not necessary, as their views and opinions were already captured in the annual formal evaluations and informal observations by the service providers. Unfortunately, at the time of this phase of work, Covid-19 had taken effect, and all planned visits to the service providers had to be cancelled. Workarounds and alternate plans were put in place but the move to online delivery for the service providers meant extra pressure in terms of their work schedules with the result, some service providers could no longer commit to meeting with us online. These are the realities of stakeholder work, environmental factors as well as many others impact research. Those who could not speak with us online were invited to email comments and feedback on the programme in terms of successful or challenging factors and improvements that could be made.

Throughout each of the two phases, the inclusion of the social marketing academics in the process was paramount. The practitioners were deeply embedded and associated with the Explorers Education Programme since its inception. The academics brought a level of objectivity to the process, whereby the research questions and methodology used in Phase 1 objectively gathered, structured and mapped the views and opinions of micro–meso–macro stakeholders involved, without providing input or contributing to the deliberative discussions. Furthermore, for Phase 2, one of the academics assumed responsibility for speaking with the service providers involved in delivering the Explorers Education Programme, to guarantee objectivity and create a space where service providers would be comfortable providing their honest feedback on the organisation and delivery of the programme. Needless to say, the inclusion of practitioners in the internal working group meant the research had practical implications, whereby necessary and effective changes and learnings could be directly applied to the Explorers Education Programme in real time, as these group members were responsible for the management and coordination of the programme. This approach of combining academia and practice in the formation of an internal working group was highly effective for co-creation and learning, both of which will be discussed next.

The opportunities from hearing from and working with Ocean Literacy stakeholders are numerous. Firstly, the CI phase allowed the internal working group to identify all those who have a voice or who can affect change for Ocean Literacy in primary schools in Ireland. Never before was such a listing completed. A challenge surrounding this identification process was general data protection regulation, but informed consent was obtained from those who participated. Secondly, bringing stakeholders together expanded the networks and influence of the Explorers Education Programme, as well as the participants themselves. It gave stakeholders the opportunity to hear the opinions of others outside their sector or specialised field, which is often missed when stakeholders gravitate to those within their specific areas of expertise. It also gave stakeholders access to resources and information which they previously did not have, as well as giving the Explorers Education Programme ideas and scope for future resources, training materials and projects. The opportunities from working with stakeholders who are part of the Explorers Education

Programme in Phase 2 meant that fellow experts in the field could advise on the development of additional activities and resources, or indeed the removal of existing ones, as well as operational changes that could possibly benefit the delivery of the programme and uptake in schools. A challenge associated with working with stakeholders in Phase 2 is the continued demand for more time and information, both of which are in short supply. Recognition of the dedication and involvement of the service providers, teachers, schools and students in the Explorers Education Programme is paramount for its continued success and implementation across Explorers Education.

## 3. The (co-)creation and learning process

Although the Explorers Education Programme began in 2006, it has been the last six years that have seen a focus on using social marketing approaches, techniques and methodologies to help grow and scale the programme to have wider influence and impact. While co-creation and learning have always been fundamental to the programme since its inception, they are increasingly important now to grow and scale the programme to increase outreach statistics as well as increase children's ocean literacy and engagement in relation to the ocean.

### 3.1 Knowledge exchanges during the research phase

After gathering 450 barriers and structuring this data across three stakeholder workshops, Phase 1 resulted in a multistage influence map of barriers to teaching 6–12 year old children about the ocean (see Figure 2). The influence map is read from left to right, highlighting the paths of influence from the highest (Level 1) to the lowest (Level 8). Influence reflects both actual and potential influence, whereby each theme has the power to have an effect, impact or degree of influence on all other themes contained within the map, to varying degrees of significance depending on their position. This means the theme of "Marine Policy and Strategy" (Level 1) exercises the highest level of overall influence for ocean literacy, while the themes "Accessibility", "Teaching Resources" and "Curriculum Framework" (Level 8) exercise the lowest level of influence and are greatly influenced by processes and outcomes in all the preceding themes.

As previously mentioned, the choice of methodology aligns with social marketing's remit to influence behaviour. With the barriers categorised and mapped, the process moves to counteract these barriers with solution seeking behaviours and actions for ocean literacy. Stakeholders identified 124 solutions and, through a co-design process, decided 51 of those were the most feasible and impactful options to leverage in future social marketing strategy campaigns, as well as adaptations to be made in the design and delivery of the Explorers Education Programme.
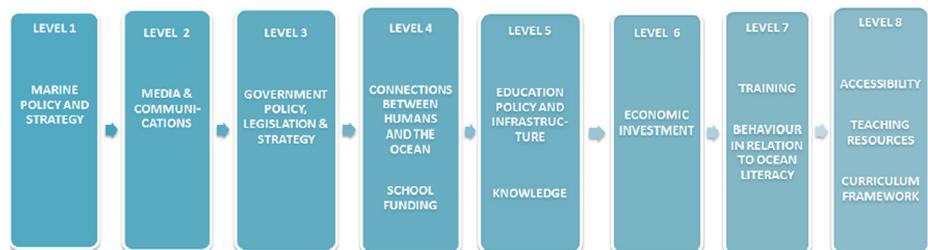
**Figure 2.**
A multistage influence map of barriers to teaching 6-12 year old children about the ocean



**Source:** Dromgool-Regan (2018)

Phase 2 involved knowledge exchange with service providers who delivered the Explorers Education Programme. This involved speaking directly with the service providers to gauge their opinions and views on the delivery of programme, the activities, the processes and how they are working from their perspective. This aspect also involved collecting the data from the service providers' formal knowledge exchanges with schools, teachers and children through questionnaires and observations.

### 3.2 The learnings arising from knowledge exchanges

*3.2.1 Stakeholder engagement.* A positive outcome of the stakeholder engagement processes was the application of the stakeholder protocols. Following the steps outlined in the protocols meant that the CI phase, Phase 1, brought stakeholders from diverse and varied backgrounds and expertise together from different levels in society, thereby, avoiding the usual suspects in the room, broadening the scope for co-creation. However, a drawback of having macro–meso–micro level stakeholders in the room is the potential for conflict, whereby a previous interaction or preconceived view or opinion on an organisation can cause tension. The team involved is highly trained and skilled in conducting focus groups and overcame these challenges by using two facilitators and an observer to ensure conflict, tensions as well as participant dominance were managed. Going forward in future collaborations, we recommend that these protocols be used again, as stakeholder's valued meeting new people in these research workshops, as they could network and cooperate afterwards for other purposes.

*3.2.2 Collective Intelligence methodology.* The use of CI in Phase 1 allowed for greater objectivity on the part of the working group. It has potential to offer new perspectives on difficult questions, where groups are introduced to alternate perspectives that they may not have previously considered. CI encourages participants to engage in consensus-based logic and reflective negotiations. This explicit engagement with complex problems not only benefits participants, but also researchers, as sessions provide deeper insights into how attitudes are influenced by group work itself (McCauley *et al.*, 2019). A downside of CI is the time and commitment required on the part of research teams and participants. The internal working group adapted the original methodology, moving from two full days of face-to-face workshops to an online data generation stage with a one-day workshop. To further entice stakeholder participation, the research teams choose venues with excellent conference room space, catering options as well as ensuring the locations are near blue spaces. We recommend the use of the adapted CI methodology in future projects, as it requires less of a time commitment on the part of invited stakeholders, which positively impacts participation.

*3.2.3 Connecting the dots.* Phase 1 built upon previous CI work completed by the social marketing academics in the working group, which researched the barriers and solutions to teaching 12–19 year olds about the ocean across Europe. Combining the results of both CI studies provides a comprehensive outlook on all of the identified barriers and co-designed solutions to teaching children about the ocean in schools, at both primary and secondary levels. Thus, our research has added to the existing body of knowledge relating to ocean literacy in the classroom. We acknowledge that these connected research studies have been extremely beneficial for the Explorers Education Programme, as the incremental improvements and changes that have been made are evidence-based, taken from country specific, as well as European level data and co-designed solutions. We recommend standing on the shoulders of giants and building upon research previously completed. Both of these European and country specific studies benefitted from looking at ocean literacy through a

social marketing lens and contributed to social marketing literature as well as the academic fields of marine science and environmental education, as well as practice.

*3.2.4 Making the research accessible.* Waiting for academic journal publications benefits researchers but not necessarily practitioners. We recommend a take and implement approach, whereby summary reports for practitioners, industry and funders are made available within a few days to a week of workshops.

*3.2.5 Assessing the impact of impact.* Phase 2 of these collaborations between academia and practice required a Collective Impact Assessment. As a programme grows and scales, so too must the evaluations and impact measurements. Oftentimes, measurement is quantitatively assessed through input and output metrics or indicators. While valuable, when it comes to impact for change, we recommend that it is also important to measure activities and processes, either quantitatively and/or qualitatively in addition to inputs and outputs, producing a reflective (see Appendix 2 for further details) and big picture view of programmes. This grasps with the social and cultural implications of behaviour and social change, as well as collective impact. The Explorers Education Programme conducts annual evaluations, using the Explorers Ocean Literacy Knowledge Questionnaires for Teachers – Evaluating Your Knowledge about the Ocean and the International Ocean Literacy Survey. The questionnaires evaluate student's marine literacy knowledge and are led by teachers. Service providers conduct concept mapping, questioning and class discussions to review the children's project work. Service providers also collect quantitative and qualitative data from the teachers via pre- and post-participation surveys and observation schedules, which reflect their knowledge and interest in teaching children about the ocean. Photographic content of school's participating in Explorers activities and samples of their work, taken by teachers and outreach officers throughout the year are also collected and thematically analysed. Qualitative data gathered from teachers provides information about their personal experience in taking part in the programme, success factors, challenges incurred and general feedback on the programme. Furthermore, teacher's feedback on future marine-themes projects informs the Explorers Education Programme on potential modules, activities, lesson plans and resources that need to be developed to sustain interest and empower teachers to keep marine literacy in their teaching curriculum and schools.

*3.2.6 Closing the feedback loop.* Given we advocate for stakeholder engagement throughout a programme, at intervals, it is necessary to close the feedback loop when phases are complete. For example, in Phase 2, service providers delivering the Explorers Education Programme commented on the fact that when they submit their end of year progress reports, they do not hear back from the coordinating team on their performance compared to other service providers or on the programme performance overall. As a result of the Collective Impact Assessment, since 2020, the Explorers Education Programme now produces annual engagement and impact reports, highlighting the annual statistics, impact, projects, champions, training, events and media activities, which can be accessed here. We recommend that all projects engaging with stakeholders should close the feedback loop through the use of reports, case studies or indeed just an email.

## 4. Impact outcomes

Over the course of our academic/practitioner collaborations and the integration of social marketing into the Explorers Education Programme, it has had a positive impact on the measurable outputs of the programme such as its outreach statistics (see Table 2). Covid-19 did impact uptake in 2020 and 2021, but this was to be expected given public health measures and restrictions. In 2022, the Explorers Education Programme had the largest number of participating children, reaching 15,237, with a growth of 21% compared to pre-pandemic numbers in 2019 and 79% compared to 2021. It also engaged with the most

teachers and delivered the most modules since its inception in 2006. These outputs positively impact the Government's agenda for ocean literacy, as the Explorers Education Programme integrates marine literacy in the primary school education curriculum and inspires young people from an early age.

| Explorers Education Programme | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|
| No. of coastal counties involved | 10 | 9 | 14 | 14 |
| No. of modules delivered | 423 | 237 | 336 | 463 |
| No. of teachers that participated | 533 | 414 | 345 | 702 |
| No. of children that participated | 12,584 | 5,963 | 8,500 | 15,237 |

**Source:** Authors' own work

**Table 2.**
Outreach statistics



**Source:** © The Explorers Education Programme

**Plate 2.**
Ocean champion
awards 2021-2022

Following Phase 2, it was recommended as an impact measure to recognise ocean champions in the programme. Beginning in 2022, the Explorers Education Programme introduced a Healthy Ocean All-School Project and Ocean Champions Awards, supported by an Ocean Champion Roadshow (see Plate 2), in recognition of the incredible work and commitment to creating healthy ocean projects in schools. This was a direct outcome of the Collective Impact Assessment phase and the knowledge exchange processes with service providers. The introduction of the project, awards and roadshow directly aligns with and measures the aim of the Explorers Education Programme which is to inspire students to become marine leaders and ocean champions.

In 2023, the programme won the "Best Education Outreach Award" category of the Education Awards in Ireland. It was specifically awarded for the Healthy Ocean Project and Ocean Champions Award, an impact recommendation from Phase 2 of the academic/practitioner collaborations. The programme is also advising other formal and informal marine educators on the implementation of similar programmes in the Network of European Blue Schools, EU4Ocean; EMSEA – European Marine Science Education Association; EU Atlantic Strategy – Pillar II Blue Skills and Ocean Literacy; and Educational Passages, USA. These partnerships strengthen the European Agenda for greater marine literacy in primary and post-primary school education.

Other impact measures captured annually are those of the programme's social media campaigns. In 2022, monthly social media campaigns highlighted the programmes and children's favourite ocean literacy facts, as well as promoting the programmes activities, workshops and events throughout the year, resulting in the metrics illustrated in Figure 3.

## 5. The ethics of impact

While there are a myriad of ethical considerations arising from a programme of this nature and size, we will discuss three significant considerations that impacted the work of this team. Firstly, when academics and practitioners work together for social change, it is important to give consideration to defining the parameters of impact. Programmes in and of themselves will have clear expectations in terms of measurable inputs, processes, activities and outputs. However, the determination of impact for the internal working group is another important consideration. Balancing the needs and expectations of practitioners and academics from the beginning means that the collaborations and research process is based on the principle of mutuality and respect. As with any research process, there may be unintended or unexpected impact outcomes. If conversations have already taken place between a team, it means there is capacity to adapt to any unintended outcomes. It is



**Figure 3.**
Social media
campaign metrics

**Source:** © The Explorers Education Programme

recommended for internal working groups to determine expected impacts and values at the beginning of a project in order for experienced outcomes to match those pre-set expectations.

Secondly, any programme with a remit to tackle human behaviour and social change, voluntarily, as is the case with social marketing, means significant consideration must be given to two interrelated concepts – inclusion and choice. Stakeholder engagement is an inclusive process, and although the protocols for stakeholder participation significantly enhanced the consideration for inclusivity and diversity in the Explorers Education Programme, they are not exhaustive. For the working group, the identification of stakeholders is a lengthy and time-consuming process affected by a number of factors such as willingness to become involved, competing interests and choices, impetus for change and institutional versus individual representation. For people, whose interests, values, attitudes and behaviours the programme is impacting, it is important to realise and accept the fact that people are free to make their own informed choices when it comes to voluntary behavioural and social change programmes. Rundle-Thiele (2022) also acknowledges this thinking when changing social, health and environmental behaviours. Programmes are about choice, not mandated change or control. The Explorers Education Programme is not mandatory in Ireland's primary school education curriculum. The continued success and impact of the programme derives from the analysis of the annual quantitative and qualitative feedback to amend and improve activities, lessons plans and resources. Empowering stakeholders by taking their feedback into consideration for future projects and content increases the likelihood of their continued participation in the Explorers Education Programme, as well as maintaining positive relationships and metrics for the programme.

The third ethical consideration for impact is how the dial continues to move as a programme progresses. Targets, metrics and outcomes never remain static. There is always a pathway for improvement, and for some, this can be an expectation or a pressure point. New impact measures can be explicitly determined by management or funders or through aspired goals set by teams. The dichotomy between shareholder and stakeholder determinations of impact and value needs careful consideration, as both are important for inclusion. For the Explorers Education Programme, both shareholder and stakeholder impact expectations are considered to ensure their appropriate measurement and communication.

## 6. Final thoughts
Measuring impact is not always easy, but it should not be treated as an after-thought, a last line of defence or a snapshot in time. Acknowledging the power of learning and feedback is essential to the proficient measurement of collective impact. As a programme grows in number and scale, analysing the impact of the impact processes is also critical. The inclusion of feedback loops with stakeholders allows for reflection points throughout the lifetime of a programme – to monitor the effectiveness of the programme structures, processes and outcomes as well as the relational and intangible activities and processes that together, determine the degree of progress towards a shared goal or outcome.

## References

Dromgool-Regan, C. (2018), *Social Marketing in a Systems Setting: Examination of Barriers and Solutions to Ocean Literacy in Irish Primary Schools*, University of Galway, Galway, Theses.

Fauville, G., McHugh, P., Domegan, C., Mäkitalo, Å., Friis Møller, L., Papathanassiou, M., Chicote, C., Lincoln, S., Batista, V., Copejans, E., Crouch, F. and Gotensparre, S. (2018), "Using collective

intelligence to identify barriers to teaching 12-19 year olds about the ocean in Europe", *Marine Policy*, Vol. 91, pp. 85-96, doi: 10.1016/j.marpol.2018.01.034.

Hynes, S., Norton, D. and Corless, R. (2014), "Investigating societal attitudes towards the marine environment of Ireland", *Marine Policy*, Vol. 47, pp. 57-65, doi: 10.1016/j.marpol.2014.02.002.

Layton, R.A. (2014), "Formation, growth, and adaptive change in marketing systems", *Journal of Macromarketing*, Vol. 35 No. 3, pp. 302-319, doi: 10.1177/0276146714550314.

McCauley, V., McHugh, P., Davison, K. and Domegan, C. (2019), "Collective intelligence for advancing ocean literacy", *Environmental Education Research*, Vol. 25 No. 2, pp. 280-291, doi: 10.1080/13504622.2018.1553234.

McHugh, P., Domegan, C. and Duane, S. (2018), "Protocols for stakeholder participation in social marketing systems", *Social Marketing Quarterly*, Vol. 24 No. 3, pp. 164-193, doi: 10.1177/1524500418761626.

NCCA (2010), "Curriculum overload in primary schools – An overview of national and international experiences", available at: https://ncca.ie/media/2052/curriculum_overload_in_primary_schools_an_overview_of_national_and_international_experiences.pdf (accessed 18 February 2015).

Parkhurst, M. and Preskill, H. (2014), "Learning in action: evaluating collective impact", *Stanford Social Innovation Review*, Vol. 12 No. 4, pp. 17-19, doi: 10.48558/BCC5-4275.

Rundle-Thiele, S. (2022), "A reflection on motivating community action to protect an endangered species using marketing", *European Journal of Marketing*, Vol. 56 No. 9, pp. 2558-2572, doi: 10.1108/EJM-03-2022-0146.

Warfield, J.N. (1976), *Societal Systems: Planning, Policy, and Complexity*, Wiley, New York, NY.

Warfield, J.N. and Cardenas, A.R. (1994), *A Handbook of Interactive Management*, Ames, Iowa State University Press.

**Appendix 1**

| Company/Position/Expertise | Name* | Contact* |
|---|---|---|
| Government departments – Education/Marine | | |
| 1. Department of Education and Skills | | |
| 2. Department of Agriculture, Food and Marine | | |
| 3. Department of Agriculture, Food and Marine | | |
| 4. Defence, Communications, Climate Action and Environment | | |
| 5. Housing, Planning, Community and Local Government | | |
| 6. Transport Tourism and Sport | | |
| 7. Jobs, Enterprise and Innovation | | |
| Education – government agencies | | |
| 8. National Council for Curriculum and Assessment | | |
| 9. Higher Education Authority | | |
| 10. Teaching Council | | |
| 11. PDST – professional development service for teachers | | |
| 12. PDST – Technology in Education/Scoiltnet | | |
| Education centres | | |
| 13. Athlone Education Centre | | |
| 14. Blackrock Education Centre | | |
| 15. Carlow Education Centre | | |
| 16. Carrick-on-Shannon Education Centre | | |
| 17. Cavan Education Centre | | |
| 18. Clare Education Centre | | |
| 19. Cork Education Support Centre | | |
| 20. Donegal Education Centre | | |
| 21. Drumcondra Education Centre | | |
| 22. Dublin West Education Centre | | |
| 23. Galway Education Director | | |
| 24. Kildare Education Centre | | |
| 25. Kerry Education Centre | | |
| 26. Laois Education Centre | | |
| 27. Limerick Education Centre | | |
| 28. Mayo Education Centre | | |
| 29. Monaghan Education Centre | | |
| 30. Navan Education Centre | | |
| 31. Sligo Education Centre | | |
| 32. Sligo Education Centre | | |
| 33. Tarbert Education Support Centre | | |
| 34. Tralee Education Centre | | |
| 35. Tuam Education Centre | | |
| 36. Waterford Teachers Centre | | |
| 37. Wexford Education Centre | | |
| 38. West Cork Education Centre | | |
| Education publishers | | |
| 39. Folens | | |
| 40. CJ Fallon | | |
| 41. The Education Company of Ireland | | |
| Education – third level | | |
| 42. DCU St Patricks – Lecturer | | |
| 43. Colaiste Mhuire, Marino Institute of Education - Marino Institute of Education Registrar | | |

**Table A1.**
List of stakeholders invited to participate in the online consultation phase of collective intelligence

| | Company/Position/Expertise | Name* | Contact* |
|---|---|---|---|
| 44. | Marino Institute of Education | | |
| 45. | Marino Institute of Education | | |
| Education – school principals/teachers | | | |
| 46. | Gaelscoil De Hide, Oranmore, Galway - Principal | | |
| 47. | Scoil Ide, Salthill, Galway city - Principal | | |
| 48. | Connemara - School Principal | | |
| 49. | Scoil Cholmain, Carna, Galway - Principal | | |
| 50. | Moycullen NS - Principal | | |
| 51. | St Joseph's National School, Killala, Mayo - Principal | | |
| 52. | Dublin – school management | | |
| School teachers | | | |
| 53. | Scoil Ide, Galway City | | |
| 54. | Scoil Rois, Galway City | | |
| 55. | Milltown NS, Co. Galway | | |
| 56. | Scoil Ide, Galway City | | |
| 57. | Galway | | |
| 58. | St. Pats, Galway | | |
| 59. | St Pats, Galway | | |
| 60. | Scoil Mhuire, Rosmuc, Galway | | |
| 61. | Scoil Chaitriona junior, Galway | | |
| 62. | St Senans, Kilrush, Galway | | |
| 63. | Ballinderry, Tuam, Galway | | |
| 64. | Thir an Fia, Galway | | |
| 65. | Killimoir NS, Galway | | |
| 66. | Oughterard NS, Galway | | |
| 67. | Athenry Boys NS, Galway | | |
| 68. | Scoil Cholmain, Carna, Galway | | |
| 69. | St Jameses, Bushy Park, Galway | | |
| 70. | St. Jameses, Bushy Park, Galway | | |
| 71. | Gaelscoil Mhic Amhlaigh, Galway | | |
| 72. | Scoil Chaitriona junior, Galway | | |
| 73. | Scoil Chaitriona junior, Galway | | |
| 74. | Ballymana NS, Galway | | |
| 75. | Tirellan, Galway | | |
| 76. | Milltown NS, Galway | | |
| 77. | Bushypark, Galway | | |
| 78. | Taylors Hill, Galway | | |
| 79. | Scoil Fhursa, Galway | | |
| 80. | Holy Trinity Girls, Galway | | |
| 81. | Maree National School, Galway | | |
| 82. | Maree National School, Galway | | |
| 83. | Maree National School, Galway | | |
| 84. | Lecanvey, Galway | | |
| 85. | St. Pats Castlebar, Galway | | |
| 86. | Kilglass National School, Galway | | |
| 87. | Scoil Mhuire, Moycullen, Galway | | |
| 88. | Coore National School, Mullagh, Co Clare | | |
| 89. | Kileen, Cork | | |
| 90. | Murrisk, Cork | | |
| 91. | Scoil Phadraig, Cork | | |
| 92. | Rehins −1st class, Cork | | |
| 93. | Blarney Street BNS, Cork | | |

**Table A1.** *(continued)*

| | Company/Position/Expertise | Name* | Contact* |
|---|---|---|---|
| 94. | Sundays Well GNS, Strawberry Hill, Cork | | |
| 95. | St. Anthony's Ballinlough, Cork | | |
| 96. | School teacher, Dublin (Golden Globe project) | | |
| 97. | Lecanvey National School, Mayo | | |
| 98. | St. Pats Castlebar, Mayo | | |
| 99. | Kileen, Mayo | | |
| 100 | Murrisk, Mayo | | |
| 101 | Myna, Mayo | | |
| 102 | Scoil Phadraig, Mayo | | |
| 103 | Scoil Phadraig, Mayo | | |
| 104 | Rehins, Mayo | | |
| 105 | Brackloon, Mayo | | |
| 106 | Rehins, Mayo | | |
| 107 | Curraheen, Kerry | | |
| 108 | St. Finnian's, Waterville, Kerry | | |
| 109 | Filemore, Kerry | | |
| Student teachers – third-level education | | | |
| 110. | 4th year – Mary Immaculate College | | |
| 111. | 4th year – DCU – St Pats | | |
| 112. | Masters in Education – Trinity | | |
| 113. | 3rd year – Clifden, Galway | | |
| 114. | 3rd year – Waterford | | |
| 115. | 3rd year – Athenry, Galway | | |
| 116. | 3rd year – Galway | | |
| 117. | 4th year – Athenry, Galway | | |
| 118. | 4th year – Ballinasloe, Galway | | |
| 119. | 4th year – Ballinrobe, Galway | | |
| 120. | 4th year – Ennis, Clare | | |
| 121. | 4th year – Dunmore, Galway | | |
| 122. | 4th year - Cork | | |
| 123. | 4th year – Port Laoise | | |
| 124. | 4th year – Waterford | | |
| 125. | 4th year – Cork | | |
| 126. | 4th year – Oranmore, Galway | | |
| 127. | 4th year – Cork | | |
| Marine – government agencies | | | |
| 128. | Marine Institute Board | | |
| 129. | Marine Institute Board | | |
| 130. | Marine Institute Board | | |
| 131. | Marine Institute Board | | |
| 132. | Marine Institute Board | | |
| 133. | Marine Institute Board | | |
| 134. | Marine Institute – CEO | | |
| 135. | Marine Institute – Corporate Services Director | | |
| 136. | Marine Institute – Fisheries, Science and Information Services Director | | |
| 137. | Marine Institute – Policy Innovation | | |
| 138. | Marine Institute – Ocean Science and Information Services Director | | |
| 139. | Marine Institute – Environment and Food Safety Director | | |
| 140. | Our Ocean Wealth Summit | | |
| 141. | Fisheries Researcher | | |
| 142. | Fisheries Researcher | | |
| 143. | Fisheries Researcher | | |

**Table A1.**

| | Company/Position/Expertise | Name* | Contact* |
|---|---|---|---|
| 144. | Fisheries Post doctoral researcher | | |
| 145. | Marine project coordinator | | |
| 146. | Marine Environment and Food Safety | | |
| 147. | Marine Environment and Food Safety Scientist | | |
| 148. | Marine Environment and Food Safety Scientist | | |
| 149. | Marine Environment and Food Safety Scientist | | |
| 150. | Marine Environment and Food Safety Scientist | | |
| 151. | Marine Environment and Food Safety Scientist | | |
| 152. | Marine Environment and Food Safety Scientist | | |
| 153. | NUI Galway/Marine Institute – Climate change and ocean acidification – Ted Talks | | |
| 154. | Marine Institute – Ocean Science and Information Services – oceanographer | | |
| 155. | RV Celtic Explorer Manager | | |
| 156. | RV Celtic Explorer operations/scientist | | |
| 157. | Marine Institute, Ocean Science and Information Services | | |
| 158. | Marine Technology – Galway Bay test site | | |
| 159. | Oceanography and Ocean Modelling | | |
| 160. | EU oceanography projects | | |
| 161. | Marine Technology Researcher | | |
| 162. | Ocean Information/IT | | |
| 163. | Digital Ocean | | |
| 164. | INFOMAR | | |
| 165. | INFOMAR | | |
| 166. | INFOMAR | | |
| 167. | INFOMAR | | |
| 168. | INFOMAR | | |
| 169. | Policy, Innovation and Research Manager | | |
| 170. | EU Policy Manager, Marine Institute | | |
| 171. | Policy, Innovation and Research, researcher | | |
| 172. | Policy, Innovation and Research, manager | | |
| 173. | Irish Maritime Development Office | | |
| 174. | BIM | | |
| 175. | Office of the Chief Scientific Adviser to the Government | | |
| 176. | Teagasc | | |
| 177. | Teagasc | | |
| 178. | Geological Survey Ireland, Director | | |
| 179. | Geological Survey Ireland | | |
| 180. | Inland Fisheries Authority | | |
| 181. | Western Inland Fisheries Board | | |
| 182. | Expert Group on Future Skills Needs | | |
| 183. | Science Foundation Ireland | | |
| 184. | Science Foundation Ireland | | |
| 185. | Science Foundation Ireland | | |
| 186. | Bord Iascaigh Mhara | | |
| 187. | Sea Fisheries Protection Authority – CEO | | |
| 188. | Environmental Protection Agency | | |
| 189. | Environmental Protection Agency | | |
| 190. | Environmental Protection Agency | | |
| 191. | National Park and Wild Life Services | | |
| 192. | Irish Water Safety | | |
| 193. | Irish Coast Guard | | |

**Table A1.** (*continued*)

| | Company/Position/Expertise | Name* | Contact* |
|---|---|---|---|
| 194. | Enterprise Ireland | | |
| 195. | Food Safety Authority | | |
| 196. | Royal Irish Academy | | |
| 197. | Commissioners of Irish Lights – CEO | | |
| 198. | An Taisce – Clean Coasts | | |
| 199. | An Taisce – Clean Coasts | | |
| 200. | Sustainable Energy Authority of Ireland | | |
| 201. | Sustainable Energy Authority of Ireland | | |
| 202. | Sustainable Energy Authority of Ireland | | |
| County councils/city councils | | | |
| 203. | Galway County Council – Environmental officer | | |
| 204. | Outreach provider | | |
| 205. | Galway City Council – Environmental officer | | |
| 206. | Cork City Council – Lifetime Lab | | |
| 207. | Galway City Council – Museum | | |
| Marine integrated policy and governance | | | |
| 208. | Atlantic Ocean Research Alliance Coordination and Support Action | | |
| Outreach | | | |
| 209. | Galway Atlantaquaria – Education director | | |
| 210. | Galway Atlantaquaria outreach | | |
| 211. | Leave No Trace | | |
| 212. | Leave No Trace | | |
| 213. | Leave No Trace – Mayo | | |
| 214. | Leave No Trace – Sligo | | |
| 215. | Leave No Trace – Donegal | | |
| 216. | Red Rose Developments | | |
| 217. | Redrose | | |
| 218. | Educator/Outreach | | |
| 219. | Loophead Education Centre – Clare | | |
| 220. | Sea Synergy | | |
| 221. | Sea Synergy | | |
| 222. | Lifetime Lab | | |
| 223. | Oceanics Surf School and Marine Education Centre | | |
| 224. | Oceanics Surf School and Marine Education Centre | | |
| 225. | Oceanics Surf School and Marine Education Centre | | |
| 226. | Toodle Lou | | |
| 227. | Fin McCool Surf School and Lodge | | |
| 228. | Letterfrack Education Centre | | |
| 229. | Education Consultant/project coordinator | | |
| 230. | Sherkin Island Station | | |
| 231. | RNLI | | |
| 232. | Tulca – Festival producer | | |
| 233. | Foroige – Manager – Galway | | |
| 234. | Foroige – training officer – Dublin | | |
| 235. | Tulca - Education Officer | | |
| 236. | Artist | | |
| 237. | Artist | | |
| 238. | Irish Sailing Association – CEO | | |
| 239. | Irish Sailing Association – Galway | | |
| 240. | Discovery Primary Science, Senior Executive Education and Public Engagement | | |
| 241. | Outeach specialist | | |

(*continued*)

**Table A1.**

| Company/Position/Expertise | Name* | Contact* |
|---|---|---|
| 242. Sinead Begley and Associates, Education Consultant | | |
| 243. Heritage schools Programme, Grants Administrator | | |
| 244. Sea Scouts Galway city | | |
| 245. Galway Science and Technology Festival | | |
| 246. Toodlelou Creativity Lab, Oranmore | | |
| 247. BirdWatch Ireland – The Seabirds of Salthill | | |
| 248. Marine Dimensions | | |
| 249. Atlantic Youth Trust | | |
| Marine formal education – third level | | |
| 250. Cork Institute of Technology – lecturer | | |
| 251. Cork IT | | |
| 252. Dublin City University – Water Institute | | |
| 253. DCU – MESTECH – Marine and Environmental Sensing Technology Hub | | |
| 254. GMIT – Marine biology lecturer | | |
| 255. GMIT – Marine and Freshwater Research centre - project manager ObSERVE | | |
| 256. SMART programme – 3rd level education/oceanographer | | |
| 257. 3rd level education/oceanographer | | |
| 258. GMIT – Research and innovation | | |
| 259. NUI Galway – jellyfish specialist | | |
| 260. NUI Galway – Oceanography lecturer | | |
| 261. NUI Galway – Marine biology lecturer | | |
| 262. NUI Galway – Earth and Ocean Sciences | | |
| 263. NUI Galway – NUI Galway lecturer sea2sky events | | |
| 264. NUI Galway | | |
| 265. NUIG – Ryan Institute | | |
| 266. NUIG – Anne Cullen Fellow | | |
| 267. UCC – MaREI – Centre for Marine and Renewable | | |
| 268. UCC (Geography) | | |
| 269. UCC (Geography) | | |
| 270. University College Cork | | |
| 271. University College Cork | | |
| 272. University College Cork | | |
| 273. University College Cork – marine biology lecturer | | |
| 274. University College Cork | | |
| 275. University College Cork | | |
| 276. University College Dublin | | |
| 277. University College Dublin | | |
| 278. University College Dublin | | |
| 279. University of Limerick | | |
| 280. Cork Institute of Technology | | |
| 281. Marine Institute – Bursary programme | | |
| ICT | | |
| 282. Insight Centre for Data Analytics/Environmentalist | | |
| 283. ESRI – Ireland – Chief Technology Officer | | |
| Media/Communications | | |
| 284. Irish Times – marine correspondent | | |
| 285. Irish Times – Science Correspondent | | |
| 286. RTE – radio | | |
| 287. Marine Times editor | | |

**Table A1.**      (*continued*)

| Company/Position/Expertise | Name* | Contact* |
|---|---|---|
| 288. Irish Skipper editor | | |
| 289. Inshore Ireland | | |
| 290. Inshore Ireland | | |
| 291. Afloat | | |
| 292. SeaFest Manager | | |
| 293. Marine Institute Communications Manager | | |
| 294. SeaFest – Event coordinator | | |
| 295. Marine Institute - Librarian | | |
| 296. Irish Sailing – head of communications | | |
| 297. DCU – Communications/Marine Phd Student | | |
| 298. PR consultant | | |
| 299. BIM – Head of Communications | | |
| 300. BIM – Communications | | |
| 301. NUIG – Science Communication/Film production | | |
| 302. NUIG – Research Office | | |
| 303. Spindrift Press – Marine Science Communications | | |
| 304. AquaTT – Marine Science Communications | | |
| 305. AquaTT – Marine Science Communications | | |
| 306. Earth Horizon Productions – eco eye | | |
| 307. RTE Television news presenter | | |
| 308. RTE Radio – Radio – Seascapes | | |
| 309. Seafever productions – Film Production | | |
| 310. Riverside Television – Film Production | | |
| 311. Direct Productions – Film Production | | |
| 312. Wild Derrynane – Film Production | | |
| 313. Durla Photography | | |
| 314. Oceansport Photography | | |
| 315. Ocean Literacy Network – secretariat | | |
| 316. Freelance media – journalist | | |
| 317. PR Works | | |
| 318. Film Production – TV presenter | | |
| 319. Keady Communications | | |
| 320. GSTF | | |
| 321. Begley Associates | | |
| 322. Design Associates | | |
| 323. ISupply | | |
| 324. Media HQ | | |
| Marine ecosystems/Marine sustainability | | |
| 325. Irish Wildlife Trust | | |
| 326. Sharks research – UCD Research Fellow | | |
| 327. Irish Whale and Dolphin Group – Chief science officer | | |
| 328. Irish Whale and Dolphin Group – General Manager | | |
| 329. Irish Whale and Dolphin Group – Irish language officer | | |
| 330. Coastwatch Ireland – International Coordinator | | |
| 331. Ulster Wildlife | | |
| 332. Seal Sanctuary | | |
| 333. Seal Rescue Centre, Wexford | | |
| 334. Fisheries Consultant | | |
| 335. AquaFact | | |
| 336. Eurogoos – EU Oceanogprahy | | |
| Parent of primary school students | | |

**Table A1.**

| | Company/Position/Expertise | Name* | Contact* |
|---|---|---|---|
| 337. | Parent | | |
| 338. | Parent | | |
| 339. | Parent | | |
| 340. | Parent | | |
| 341. | Parent | | |
| 342. | Parent | | |
| 343. | Parent | | |
| 344. | Parent | | |
| 345. | Parent | | |
| 346. | Parent | | |
| 347. | Parent | | |
| 348. | Parent | | |
| 349. | Parent | | |
| 350. | Parent | | |
| 351. | Parent | | |
| 352. | Parent | | |
| 353. | Parent | | |
| 354. | Parent | | |
| 355. | Parent | | |
| 356. | Parent | | |
| 357. | Parent | | |
| Marine economy | | | |
| Marine food industry | | | |
| 358. | Carlingford Oyster Company – Shellfish farming – oyster farm | | |
| 359. | Marine Harvest – Aquaculture | | |
| 360. | Health – Seaweed Cooking | | |
| 361. | Food writer | | |
| 362. | Bantry Marine Research Station | | |
| Marine Advanced Technologies | | | |
| 363. | SolarWinds - Senior Vice President, Finance and Operations | | |
| 364. | Engineering/Shipping | | |
| 365. | P&O – ROV operator | | |
| 366. | Seiche – hydrophonics | | |
| 367. | Smart Bay | | |
| 368. | Smart Bay | | |
| 369. | P&O – Operations manager | | |
| 370. | Techworks Marine Ltd | | |
| 371. | DARE Technology Ltd (DARETECH) | | |
| 372. | Marine Engineering – ocean energy | | |
| 373. | CyberColloids Ltd | | |
| 374. | Irish Observer Network Ltd | | |
| 375. | Celtic Sea Minerals (Marigot Ltd) | | |
| 376. | Irish Seaspray (Oilean Mara Teo) | | |
| 377. | Irish Seaweed Consultancy Ltd | | |
| 378. | Ocean Energy Ltd. | | |
| 379. | Sea Power Ltd | | |
| 380. | TFI Marine Ltd | | |
| 381. | Galway Atlantaquaria – Director | | |
| 382. | Cleggan Project | | |
| 383. | Marine Tourism | | |
| 384. | SeaLife Bray Aquarium | | |

**Table A1.**

*(continued)*

| | Company/Position/Expertise | Name* | Contact* |
|---|---|---|---|
| 385. | Dingle Aquarium | | |
| 386. | Galway City Museum | | |
| 387. | National Maritime Museum of Ireland – Dublin - Director | | |
| 388. | Sea Synergy | | |
| 389. | Dublin Zoo – Head of Education | | |
| 390. | Claddagh Boats | | |
| 391. | Surfer/Environmentalist | | |
| 392. | Fin McCool Surf School and Lodge | | |
| 393. | Diver | | |
| 394. | Seasearch Ireland | | |
| 395. | Flagship management – cruise ships | | |
| 396. | Irish Ferries | | |
| 397. | Galway Ports | | |
| 398. | Hospitality Industry – manager | | |
| 399. | Hospitality industry – events manager | | |
| 400. | Health expert/consultant | | |

**Note:** *Names and contact details have been removed in line with GDPR.
**Source:** Dromgool-Regan (2018)

**Appendix 2**

| | |
|---|---|
| *Stage 1*<br>What's happening? | *Co-discovery: Explorers Education Programme is in development*<br>• You are assembling the core elements of the programme, developing action plans and exploring different strategies and activities<br>• There is a degree of uncertainty as to what will work and how<br>• New questions, challenges and opportunities are emerging |
| Reflective question | What needs to happen? |
| *Stage 2*<br>What's happening? | *Co-design: Explorers Education Programme is evolving and being refined*<br>• The core elements of the programme are in place and is implementing agreed upon strategies and activities<br>• Outcomes are becoming more predictable<br>• The context of the programme is increasingly well-known and understood. |
| Reflective question | How well is the programme working? |
| *Stage 3*<br>What's happening? | *Co-delivery: Explorers Education Programme is stable and well-established*<br>• The programme is well-established<br>• It has significant experience and increasing certainty about "what works"<br>• The programme is ready for a determination of impact, merit, value or significance |
| Reflective question | What differences did the programme make? |

**Table A2.**
Collective impact
assessment stages

**Source:** Adapted from Parkhurst and Preskill (2014)

**Corresponding author**
Patricia McHugh can be contacted at: patricia.mchugh@universityofgalway.ie