

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

Collective
impact for
ocean literacy

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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

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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

- 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • Marine biodiversity – animals and plants • Caring for our marine environment and the impacts of litter • Ocean literacy and the arts – learning about ocean legends, myths and fairy tales • The Sustainable Development Goals. • Marine technology – hydrothermal vents, submarines and Remotely Operated Underwater Vehicles (ROVs) 	<ul style="list-style-type: none"> • Ocean Literacy and SDG Resources – guides, presentations, booklets, videos, ocean education wheel • Deep Sea Species – the good the bad and ugly deep sea species books • Learning about Squid – squid dissection film and fun facts, information books on squid, workbooks, presentations, lesson plans and activities • Turtle talk with Sea Turtles – workbook, photos, infographics and fun facts • Solutions to ocean pollution to support environmental awareness and care projects – workbooks, sea art construction projects, exhibitions, action board poster • Ocean fact or fiction cards • 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) • Handbook and learning activities
STEM workshops	Workshops that align with maths, science and engineering weeks in the school calendar	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Handbook and learning activities

Table 1.
Explorers Education Programme activities and examples of resources

Source: Authors' own work

- 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 education 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

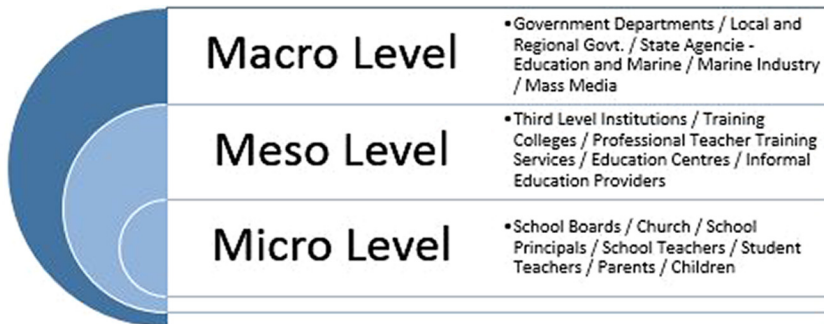


Figure 1.
Broad classification
of marine and
education
stakeholders

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.

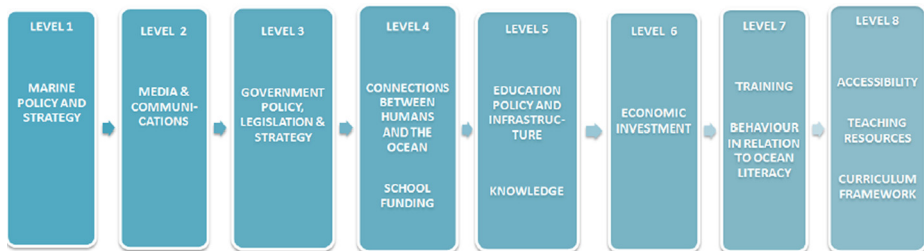


Figure 2.
A multistage influence map of barriers to teaching 6-12 year old children about the ocean

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.

Collective
impact for
ocean literacy

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

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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.

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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/Scoilnet		
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

(continued) 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.	Oughterd 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.	Taylor's 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		

(continued)

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.	Outreach 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/Environmental		
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 Oceanography		
	Parent of primary school students		

*(continued)***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 – hydroponics		
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 \(2018\)](#)

Table A1.

Table A2.
Collective impact
assessment stages

<i>Stage 1</i> What's happening?	<i>Co-discovery: Explorers Education Programme is in development</i>
Reflective question	<ul style="list-style-type: none"> You are assembling the core elements of the programme, developing action plans and exploring different strategies and activities There is a degree of uncertainty as to what will work and how New questions, challenges and opportunities are emerging What needs to happen?
<i>Stage 2</i> What's happening?	<i>Co-design: Explorers Education Programme is evolving and being refined</i>
Reflective question	<ul style="list-style-type: none"> The core elements of the programme are in place and is implementing agreed upon strategies and activities Outcomes are becoming more predictable The context of the programme is increasingly well-known and understood. How well is the programme working?
<i>Stage 3</i> What's happening?	<i>Co-delivery: Explorers Education Programme is stable and well-established</i>
Reflective question	<ul style="list-style-type: none"> The programme is well-established It has significant experience and increasing certainty about "what works" The programme is ready for a determination of impact, merit, value or significance What differences did the programme make?

Source: Adapted from [Parkhurst and Preskill \(2014\)](#)

Corresponding author

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