Co-creating a Sea Change Social Marketing Campaign for Ocean Literacy in Europe: A Digital Interactive Tool for Environmental Behavior Change

26

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Chapter Overview
Sea Change was a European campaign (www.seachangeproject.eu) designed to bring about a fundamental transformation, a "Sea Change" in the way European citizens experience their relationship with the sea, by empowering them as "ocean-literate" citizens. With Sea Change using co-creation behavioral change theory principles across a number of campaigns, e.g., citizen science initiatives, youth camps, crab watching, marine litter with policy makers across Europe, and blue schools, this case study concentrates on one of the collaborative and cooperative campaign for a digital interactive tool in the educational sector.

Campaign Background and Context

European citizens are not fully aware of the true extent of the medical, economic, social, political, and environmental importance of the sea to Europe and indeed to the rest of the world (Hynes, Norton, & Corless, 2014; Tran, Payne, & Whitley,

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D. Z. Basil et al. (eds.), *Social Marketing in Action*,
Springer Texts in Business and Economics,
https://doi.org/10.1007/978-3-030-13020-6_26

2010). Neither is there awareness of how our day-to-day actions can have a cumulative negative effect on the health of the ocean and seas (Strang, DeCharon, & Schoedinger, 2007)—a necessary resource that must be protected for all life on the planet earth to exist. In other words, European citizens lack a sense of "Ocean Literacy"—an understanding of the ocean's influence on us and our influence on the ocean. An ocean-literate person *understands* the importance of the ocean to humankind; can c*ommunicate* about the ocean in a meaningful way; and is able to make informed and responsible *decisions* regarding the ocean and its resources (McHugh et al., 2016; National Oceanic and Atmospheric Administration, 2013; Schoedinger, Tran, & Whitley, 2010).

The Galway Statement on Atlantic Ocean Cooperation, 2013, reinforced this need for Ocean Literacy for Europe. Top marine scientists from EU, USA, and Canada identified convergences between their respective scientific agendas. They concluded that together we can build a capacity to understand and predict major Atlantic and Arctic processes, as well as the changes and risks they carry in relation to human activities and climate change. We can better understand the Arctic and North Atlantic Ocean to promote the sustainable management of its resources, particularly with regard to climate change.

Sea Change was a European campaign (www.seachangeproject.eu) designed to bring about a fundamental transformation, a "Sea Change" in the way European citizens experience their relationship with the sea, by empowering them as "ocean-literate" citizens—to make informed and responsible decisions regarding the ocean and its resources, and to take direct and sustainable action toward healthy seas and ocean, healthy communities, and ultimately, a healthy planet. Co-creating environmental behavior change was a central theory guiding the work of Sea Change. To create is to make something happen as a result of one's own actions. To co-create is to make something happen as a result of people working together. Co-creating a Sea Change was a collective process that connects and empowers people to become ocean literate. Co-creating a behavioral sea change was about people coming together and making Sea Change happen through their everyday choices, decisions, and behaviors.

With Sea Change using co-creation behavioral change theory principles across a number of campaigns, e.g., citizen science initiatives, youth camps, crab watching, marine litter with policy makers across Europe, and blue schools, this case study concentrates on one of the collaborative and cooperative campaigns for a digital interactive tool in the educational sector.

Strengths, Weaknesses, Opportunities, Threats (SWOT) Analysis

With the success of any environmental behavior change campaign first dependent on what is going on in the surrounding environment, a literature review was first conducted from a macro-Sea Change campaign perspective. This was followed by

extensive formative research (Fauville et al., 2018) in the form of ocean literacy dialogue forums in eight European countries (Ireland, Sweden, Belgium, Denmark, Greece, Spain, Portugal, and UK) with stakeholder groups involved in teaching, education, outreach, curriculum, media, regulation, and policy. This market analysis uncovered 657 barriers and 316 benefits to teaching 12–19-year-olds across Europe about the ocean, which are summarized below.

Strengths

Each partner from the nine countries involved in the Sea Change campaign received environmental behavioral change training, learning how to co-create a transformative sea change in Europe (McHugh and Domegan, 2018).

Through Sea Change, ocean literacy can be brought into the classroom.

The process protocols developed for a digital interactive tool can be developed in a manner that acts as good practice and template for other environmental behavior change contexts. Sea Change's Massive Open Online Course "From ABC to ABSeas: Ocean Literacy for All" helps prepare teachers by informing them about ocean literacy and helping them incorporate marine education into educational practices (Fauville et al., 2018).

Sea Change project partners had extensive knowledge and experience of inquiry-based teaching.

Weaknesses

Culturally, the ocean is underappreciated, resulting in people having limited ability to understand the importance of the ocean in their everyday life.

There is no depository, database, or Web site where all ocean literacy resources can be accessed.

Sea Change resources such as the iBook, the Massive Open Online Course, the ocean edge directory, virtual laboratories, and ocean literacy games were all developed concurrently.

Many ocean literacy resources are only produced in English even though Europe is a continent of many different languages.

Opportunities

EU and national policies recognize ocean literacy as a priority.

The trend is towards innovative forms of Interactive engagement and collaboration—inquiry-based teaching—innovative teaching methods and hands on activities (McCauley, Gomes and Davison, 2018; Gomes and McCauley, 2016).

Wide-ranging, collaborative, and decentralized efforts are emerging to create a more ocean-literate society. For example, in America, formal and informal

educators and curriculum and program developers have developed a "road map" that helps them build coherent and conceptually sound learning experiences for students from kindergarten through 12th grade (www.coexploration.org).

Ocean literacy has relevance (although not explicitly stated) within the existing formal curriculum and may provoke opportunities for thematic teaching/cross-curricular interest within the traditional science subjects and across other subject areas (e.g., business studies and geography).

There is a shift toward online and tablet technology, reusable and open source, support mechanisms available to fuel motivation, and interest in the classroom (Comiskey, McCartan, & Nicholl, 2013; Maich and Hall 2015; Heemskerk, Volman, Admiraal, & ten Dam, 2012; Bingimlas 2009; Kim 2013).

Teachers are willing to participate in the design and evaluation of digital tools (McHugh and McCauley, in press), and therefore there is an opportunity to co-construct teaching methodologies that are best suited to their setting.

New partnerships across different networks could potentially integrate, share resources, and generate a "network of networks."

Threats

The ocean itself is a threat. Its inherent complexity challenges people's ability to get an overview of the ocean system. It can be difficult to access the ocean. The ocean is largely unseen and unexplored.

Current school structure and curriculum are land-based.

Many teachers, especially at the junior level, lack confidence in ocean knowledge; they may fear being asked questions that they do not know the answer to.

There are restrictions in terms of curricular demands, time constraints, and large classes. The primary goal for schools is to deliver the specified curriculum and *where time allows* an extension of further application and areas of interest.

Although some schools are close to the ocean, many are not. Therefore, many limitations arise in terms of getting to a sea location, e.g., insurance, distance, volunteers, and transport.

Health and safety issues surround visiting the ocean.

There is a lack of teacher training in the area of marine science/ocean literacy.

There is a lack of policy at EU and national levels to implement broader programs regarding ocean literacy.

Limitations across schools in terms of technology resource support for digital teaching and learning tools.

There is the perception that there are few marine careers beyond traditional marine jobs, e.g., tourism, fishing, and shipping.

Project partners learned how to overcome the weaknesses and threats detailed above through tailored, hands-on experiential training in environmental behavior change. Co-creation theory and five fundamental co-creation concepts for environmental behavior change underpinned the work in Sea Change (McHugh and Domegan, 2018):

- *People's behavior*—understand why people do what they do at present, their thoughts, and motivations.
- *Choices*—understand people have lots of choices, and this represents competition.
- *System thinking*—recognize the importance of the system people are living in with all its political, cultural, social, technological, and economic characteristics.
- *Creativity*—there must be elements of imagination, creativity, and innovation to make behavior change as attractive and motivating as possible.
- *Values*—it is important to understand what people value and do not value.

Target Audience

Many complex problems, including the challenge of creating an ocean literate society, "encompasses or affects numerous people, groups and organizations … where no one is fully in charge … and many individuals, groups and organizations are involved or affected or have some partial responsibility to act" (Bryson, 2004, 23–24). Setting boundaries and engaging with stakeholders ensure that all potential groups and individuals who can affect or be affected by creating an ocean-literate society were considered. Thus, the market was defined as the formal and informal education sectors across Europe, spanning landlocked and coastal regions. The primary target audience was secondary school teachers of 12–15-year-olds in formal education. The secondary target audience consisted of the students that are being taught, while the tertiary target audience focused on informal educators, organizations/institutions engaged in informal education such as marine institutes, museums, and aquariums. The targeted audiences spanned both iPad and non-iPad schools where intended users had the ability and capacity to access and use digital technology.

For co-creation, collaborating and empowering each of these target audiences together (Fig. 26.1) were foundational to Sea Change and its approach to its target markets.

Active versus passive participation is more empowering because it reflects values important to the target audiences for community participation. It enables target groups to become dynamic and equal in developing a deep understanding of experiences. It builds relationships with the target audiences to provide for mutual learning. Importantly, the coordinating systems (formal and informal education) around the behavioral change come into operation, which means public policy and media are relevant too (Bunn, Savage, & Holloway, 2002). The target audience's systems have to facilitate the manifestation of the new Sea Change ocean literacy, or it cannot come into being.

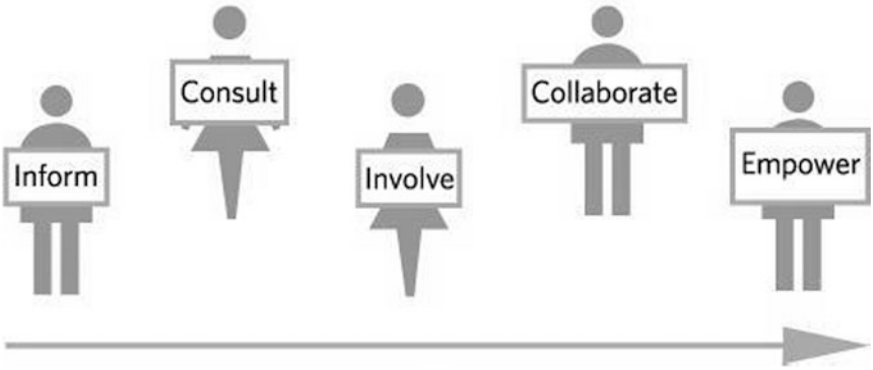

Fig. 26.1 Levels of participation. *Source* Davies and Simon (2013)

Campaign Objectives

Sea Change had two overarching goals. The first goal was to empower educators, students, and educational communities across Europe to integrate and promote ocean literacy principles. The second goal was to measure if change was happening and to ensure that efforts to sustain an ocean-literate society in Europe continued beyond the life of Sea Change.

Behavioral Objectives

Sea Change's empowerment goal was translated into three behavioral objectives. The first was to strengthen the capacity and self-efficacy of teachers to introduce ocean literacy into their curriculum (science and nonscience subjects). The second was for teachers to anchor an increase in students' ocean literacy in a curriculum that lacks marine science within the secondary classroom. Thirdly, to transform instructional content so that students could engage with a more digitally interactive experience. The aim was for the campaign not only to introduce marine science into the regular curriculum, but to act as a tool to engage teachers and students in behavioral change because of the multiple possibilities to connect to their real-life experiences.

Co-creation Objectives

Legacy goals for Sea Change were captured in its co-creation objectives for the campaign. These were to (a) continually sense and learn with all the formal and informal educational stakeholders and adapt the campaign accordingly and (b) design and implement an approach for sustainable social change incorporating the five fundamental co-creation concepts.

Competition

In Sea Change, it was important to identify the competition (Kotler and Lee, 2010; McHugh and Domegan, 2018). There were three competing factors that could interrupt or delay the desired behavior change: "choices target audiences would prefer over the ones Sea Change are promoting" (e.g., digital games); "choices target audiences have been doing 'forever,' such as a habit that they would have to give up" (e.g., using green, land-based examples as opposed to ocean examples); and "organizations and individuals who send messages that counter or oppose the desired behavior change" (e.g., textbooks are easier to use, accessible to all, and more economical than iBooks).

Positioning

Building on current trends in social marketing toward interactive games technology for behavioral change (Russell-Bennett et al, 2018; Mulcahy, Russell-Bennett and Rundle-Thiele, 2015), Sea Change positioned this campaign as a digital interactive tool (McHugh, McCauley, Davison, Raine, & Grehan, in press) to support curriculum teaching and learning as opposed to a mandatory course book. Importantly, the campaign was not simply the digitized content of a book originating from a print format. The various interactive functionalities had the potential to create a connected seamless transition from awareness to knowledge acquisition and assessment to behavioral change, through empowered edutainment *with* students. It is this seamless transition that was the key benefit for the teacher in using this product.

The campaign also had to factor in two further positioning possibilities—the primary target audience (teachers) and secondary target audience (students), in particular, could be either "digital residents" or "digital visitors" (McHugh and McCauley, in press). This positioning recognizes that digital visitors (non-iPad schools) are enamored with the technology and other product features, whereas digital residents (iPad schools) may have other technology demands of the offering; for example, they may expect it to be quicker and more capable. The tertiary target audience (outreach officers, marine museums, etc.) were more likely to be "digital residents" themselves but could be dealing with either "digital residents" or "digital visitors."

Marketing Strategy

Product Strategy

The core behavior change sought was to strengthen the capacity and self-efficacy of teachers to introduce ocean literacy into their curriculum. The digital interactive iBooks

would strengthen the confidence, belief, and abilities of teachers in teaching and incorporating ocean literacy into their curriculums, and as a consequence of their new knowledge, attitude and beliefs would then increase students' awareness and knowledge of ocean literacy. Supporting the desired behavioral change was the tangible product; a digital interactive iBook for Harmful Algal Blooms (HABs) (Fig. 26.2—https://itunes.apple.com/us/book/harmful-algal-blooms/id1214392876?mt=11). The tangible product offering captured two benefits of engagement and interactivity with fun for the target audiences supporting the edutainment positioning. The augmented product offering included technology features such as images, videos, experiments, games, interactive quizzes, and interactive design widgets embedded in the book, enabling students to take notes. Other product features for transformative instructional content for teachers included keynote presentations, interactive images, interactive galleries, scrolling sidebars, pop-up functionality, videos, study cards, scientific glossary, access to dictionary, curiosity facts, and quizzes. The HABs iBook has five topical chapters that linked with Sustainable Development Goals suitable for non-science subjects such as English and art (Fig. 26.3) with each chapter ending in multiple-modal choice questionnaire consisting of seven questions, and a final subsection that collates content for student project development.

Price Strategy

While no monetary price was charged for the HABs product, costs are incurred by the target audiences: Time had to be spent familiarizing themselves with the HABs materials. For some target audiences, there was the unfamiliarity and discomfort of working digitally, while others had to overcome school norms toward land-based lessons.

Place Strategy

The iBook store provided free accessible download of the iBook in 51 countries worldwide. See https://itunes.apple.com/us/book/harmful-algal-blooms/id1214392876?mt=11. The iBook is not available on Android. Other online resource depositories also provided digital access such as Scientix.eu and EMSEA. Physical access was possible in locations such as aquariums and marine centers that featured the offering as part of an exhibit.

Promotion Strategy

Sea Change pursued an integrated marketing communication campaign using an online and off-line promotional mix. Traditional advertisements appeared in

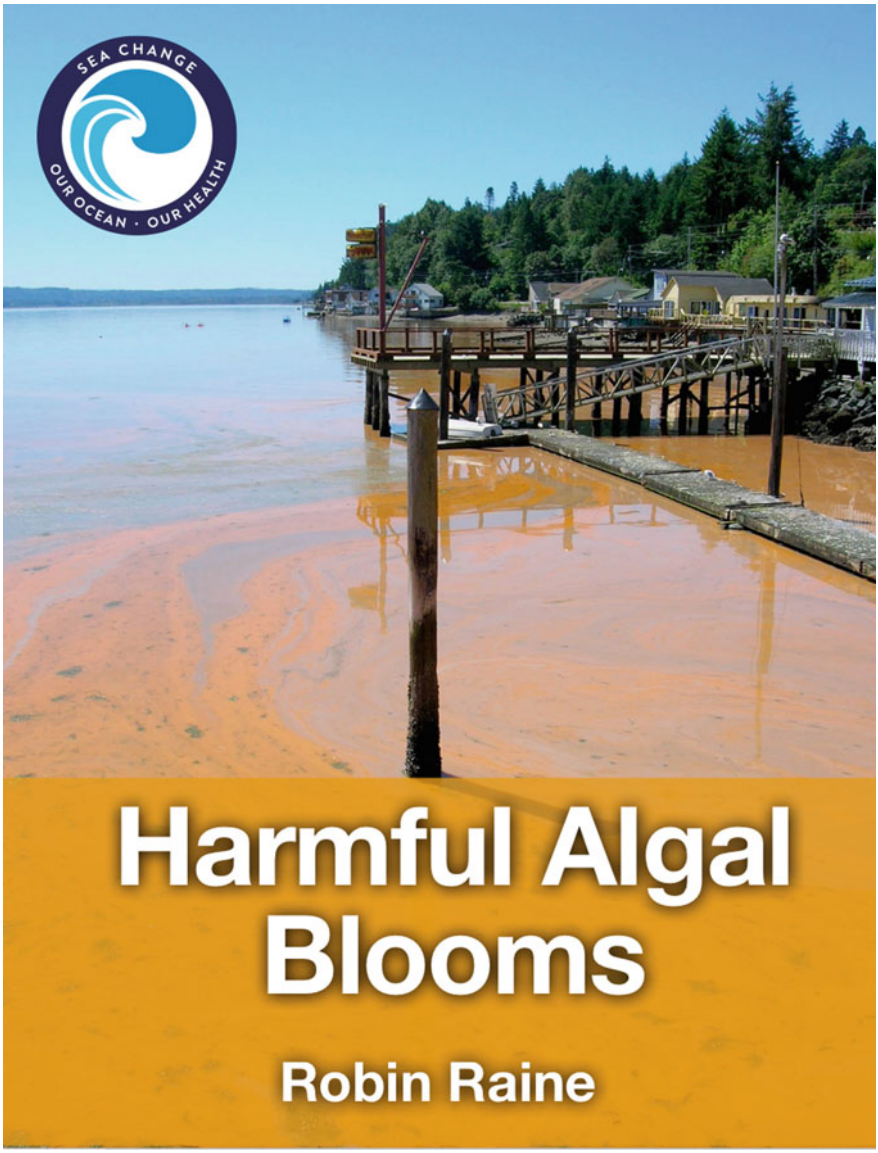

Fig. 26.2 Digitally interactive HABs iBook

local newspapers and on local radio, supported with complimentary social media activities such as tweets and Facebook postings (see https://www.facebook.com/SeaChangeProjectEU) (Figs. 26.4 and 26.5).

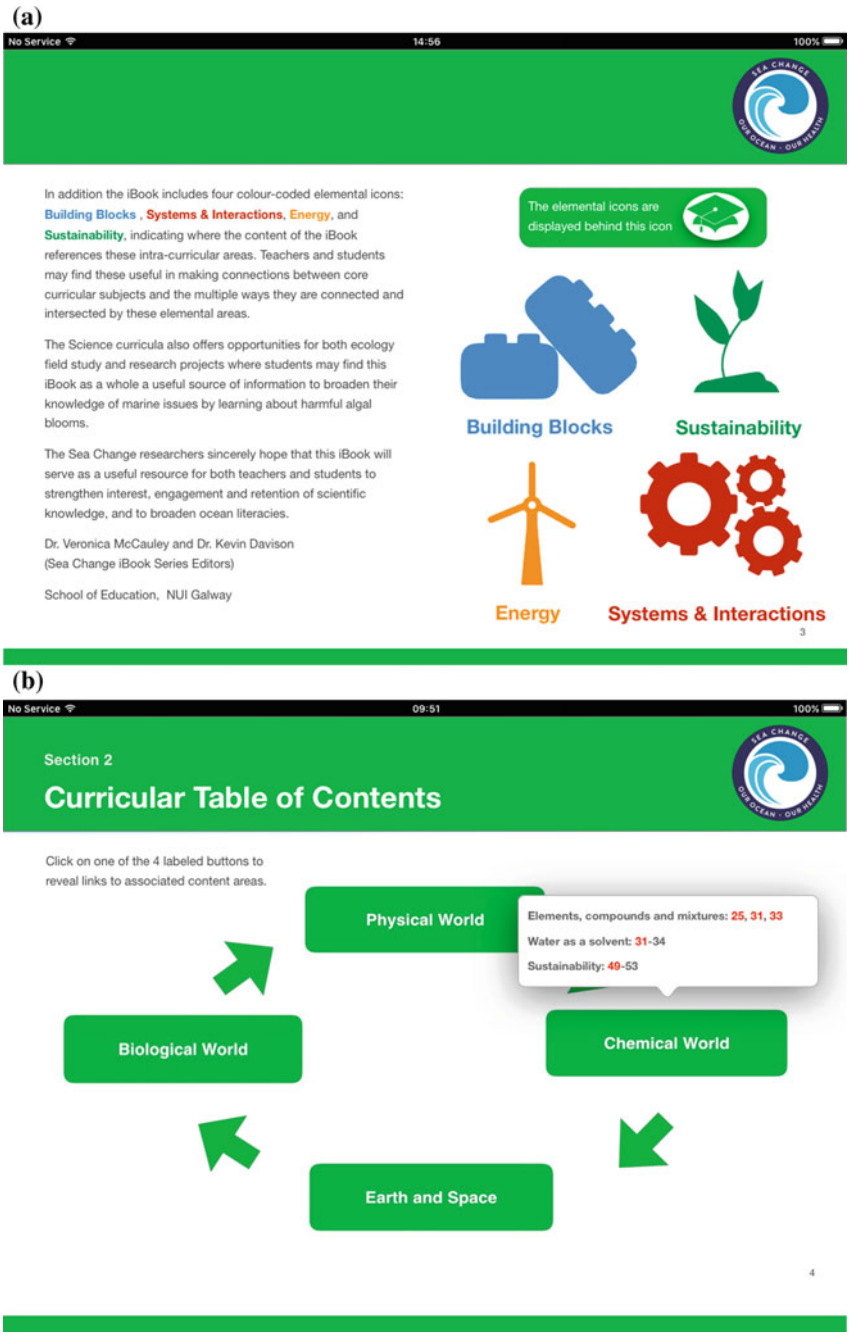

Fig. 26.3 HABs product features for nonscience target audiences

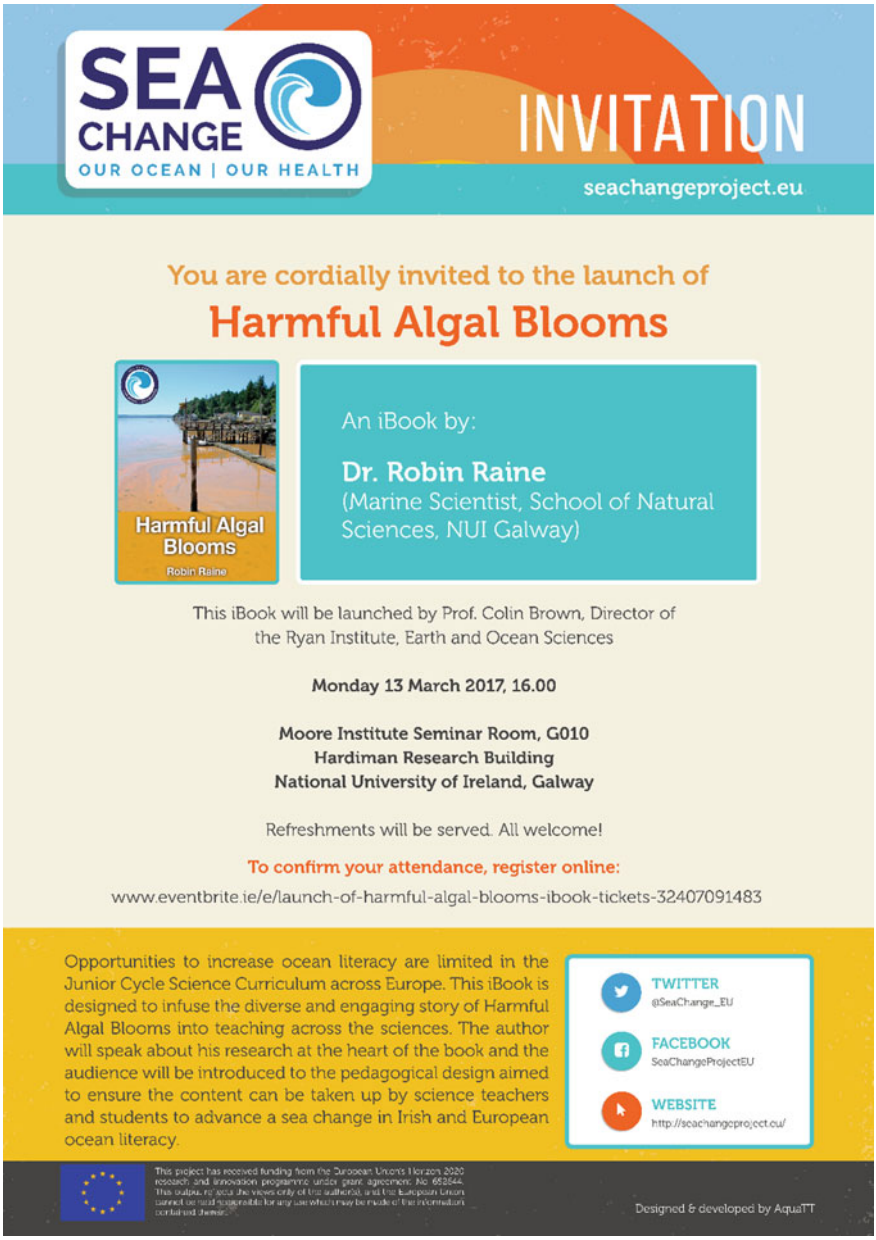

Fig. 26.4 Sample promotional materials

Fig. 26.5 Sample promotional materials

People Strategy

The co-creation nature of Sea Change resulted in a highly participatory people–process steeped in collaboration, empowerment, and direct active engagement with the target groups. This meant speaking, listening, and working *with* target audiences on their own terms throughout all of the campaign and not *on* or *for* the target groups.

Process Strategy

The key outcome of this Sea Change campaign is co-creating change. This process started with the co-discovery of lived experiences, values, attitudes, beliefs, knowledge, motivations, and current behaviors among the three target audiences. For example, over 100 people were involved in scoping out the initial design of the HABs tool including teachers, students, marine educators, scientists, teacher educators, and Sea Change European partners. It also embraced system actors such as media and policy stakeholders through the ocean literacy dialogue forums discussed in the SWOT analysis above. This was followed by a co-design phase to capture new meanings through the digitally interactive HABs iBook ending (see evaluation below) with co-delivery through the existing channels of distribution in schools, marine centers, and aquariums that either blocks or empowers individuals to alter their behaviors.

Research and Program Evaluation

To measure if change was happening, the first phase of evaluation focused on feedback from scientists, teachers, students, and other informal education stakeholders across European countries to help with the pedagogical design of the tool. This evaluation consisted of semi-structured interviews, teacher journal reflections, and post-lesson student exit cards (McHugh, Domegan, & Duane, 2018). Pilot data revealed a number of ways that students were making connections to their everyday lives and past experiences, which in turn strengthened their personal interest in the ocean. Fifty-three percent of student exit cards noted that the interactive elements in the iBook were fundamental to their learning about the ocean. The three aspects students mentioned on a continual basis were pictures, videos, and the review questions. For example:

> The pictures, it was interesting, the test at the end of the chapters, the resources within the book, the videos, the variety of chapters and topics. I loved the 'did you know' tabs, pictures, videos, fun facts. (Clare, Exit Cards, Lesson 3)

> Images, review questions and 'did you know' sections helped me learn about the oceans. (Jake, Exit Cards, Lesson 1)

A second form of evaluation to measure if change was happening comes in the form of download metrics. With the campaign just launched, initial metrics show 128 downloads within first few months across multiple countries (Figs. 26.6 and 26.7).

However, the official metrics for the iBook downloads can be deceptive as they only measure when an individual user downloads the iBook once. If that same user then transfers the iBook to a class set of 35 iPads, the official iTunes metrics considers this as only one download and therefore is not reflective of the actual iBooks in use or the potential reach of the information and ocean literacy.

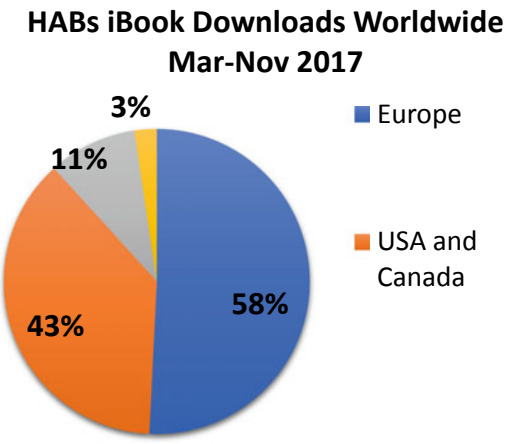

Fig. 26.6 HABs iBook downloads worldwide, March–December 2017

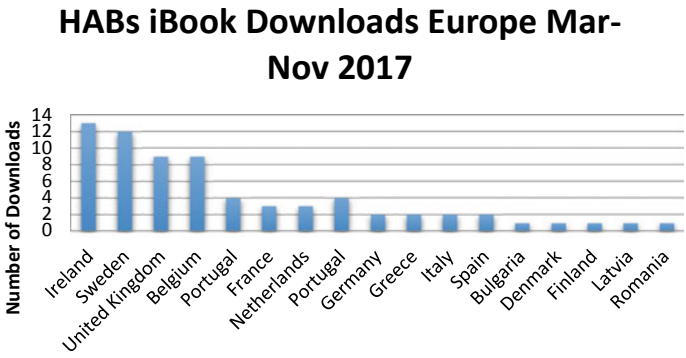

Fig. 26.7 HABs iBook downloads across Europe, March–December 2017

Discussion and Lessons Learned

From the outset, Sea Change fundamentally recognized that complex environmental and sustainable societal problems do not occur in a vacuum. Such problems incorporate multiple stakeholder groups at multiple levels of influence (McLeroy, Bibeau, Steckler, & Glanz, 1988; Dibb, 2014; Hastings and Domegan, 2018). Without co-discovering the issues and without debating and discussing complex engagement issues, we run the risk of multiple and uncoordinated attempts at addressing the issue, without all parties at the table. The evidence shows this can result in many false starts if behavioral change deliberations do not engage a multiplicity of macro-micro-stakeholders that can contribute different insights and expertise toward meaningful strategies for change. Co-creating change through a highly participatory design approach is one of many valuable inclusivity strategies for social marketing. Co-creation, its five fundamental concepts (McHugh and Domegan, 2018), and the processes of co-discovery, co-design, and co-delivery (Hastings and Domegan, 2018; McHugh and Domegan, 2018) in this case provide theoretical and practical contributions for social marketing. The integrative and people-powered approach of co-creation theory facilitates top-down and bottom-up thinking. It also considers pathways and priorities for future actions, allowing groups to come together to co-design and co-create change.

The multiplicity of stakeholders, from co-discovery to co-design and co-delivery of the campaign, not only was useful to fine-tune the social marketing strategy but can potentially have a catalytic effect on the ongoing and growing conversations on oceans and waterways; e.g., the iBook is currently being translated for use in Europe and South America.

Lesson Learnt: Co-creation is a framework for seeing interrelationships rather than things, for seeing "patterns of change" rather than static "snapshots" (Senge, 2006; McHugh and Domegan, 2013; Biroscak et al., 2014). The most universal and

powerful influences on a person's behavior are those closest to them—the ones they take for granted and ones they do not even realize are there and cannot discuss or describe. Their immediate environment and the system around them have a powerful impact on their lives whether they realize it or not.

However, deep one digs in a bid to understand a person's behavior, and the social marketer will not get a full picture unless the importance of the system the target audiences are living in, with all its political, cultural, social, technological, and economic characteristics, is recognized. Every person is influenced by the circumstances in which they find themselves. For sustainability, it is important to think about wider-scale change and transformation as well as individual behaviors.

Lesson Learnt: *Co-creating behavioral change means a large portion of the knowledge is acquired through the participatory process. Relationship marketing is critical to success.*

Interactivity as a behavioral change force in a campaign appeals to personal relevance and experience. Digital interactive tools and games offer multiple opportunities to engage audiences for behavioral change. Interactivity creates inherent interest leading to attention and engagement in real-world scenarios that facilitate behavioral change. It also presents a novel domain where the target audience are, as digital residents, experts.

Within this campaign, major aspects of the co-creation "defenestrated" and did not act as predicated (Dede, 2005, p. 6). This allows for a self-corrective and adaptive process, enabling modification and assurance of a closer line between theory and technological innovation (Hoadley, 2004; Wang and Hannafin, 2005). The lesson learnt was of the bottom-up, grassroots route to self-organization for behavioral change. With this in mind, this campaign can be lifted from the immediate context of ocean literacy and adapted to other interactive technology contexts such as energy efficiency and Sustainable Development Goals.

Lesson Learnt: *No matter how complex or removed the problem, connecting the problem to personal experiences and personal relevance is central to digital interactivity and its success. A bottom-up and grassroots approach compliments top-down and policy initiatives.*

Evaluation and measuring impact are not always easy, as shown by the download metrics, but it should not be treated as an after-thought or a last line of defense (Bayliss-Brown, McHugh, Buckley, & Domegan, 2015).

Lesson Learnt: *For the possibility of legacy, scaling out, and replicating its success more widely, it is important to reflect on what is being worked on, together, and determine if change is actually happening.*

Discussion Questions

1. What has co-creation theory to do with environmental behavioral change?
2. What competitive analysis could be conducted to further inform the positioning decisions?
3. What other social marketing theories could inform the co-creation participatory process?
4. What engagement strategy would you recommend as part of the people strategy?
5. What partnership strategy would be the most appropriate to the campaign?

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