



Exploring Our Oceans: Using the Global Classroom to Develop Ocean Literacy

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OPEN ACCESS

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Specialty section:

This article was submitted to
Marine Ecosystem Ecology,
a section of the journal
Frontiers in Marine Science

Received: 07 January 2019

Accepted: 04 June 2019

Published: 25 June 2019

Citation:

Fielding S, Copley JT and Mills RA
(2019) Exploring Our Oceans: Using
the Global Classroom to Develop
Ocean Literacy.
Front. Mar. Sci. 6:340.
doi: 10.3389/fmars.2019.00340

Developing the ocean literacy of individuals of all ages from all countries, cultures, and economic backgrounds is essential to inform choices for sustainable living in the future, but how we reach and represent diverse voices is a challenge. Massive Open Online Courses (MOOCs) offer a possible tool to achieve this goal, as they can potentially reach large numbers of people including those from lower and middle income regions. The number of MOOCs themed around ocean science and/or literacy is growing rapidly, and here we share experience of developing and delivering a MOOC entitled “Exploring Our Oceans,” which has run ten times in the past 4 years with around 40,000 participants worldwide. The “Exploring Our Oceans” MOOC incorporates a blend of online teaching techniques grounded in both instructivist and constructivist theories, thereby emphasizing contributions from a global community of learners and encouraging individual, independent action in relation to ocean citizenship. The impacts of this MOOC include evidence of changed awareness and attitudes to ocean issues; increased applications and participation in undergraduate and postgraduate programs; development of communication and outreach skills in the postgraduate community and partnership building with Nelson Mandela University, South Africa. These impacts, and vignettes of learner experiences in the course, are discussed in the context of the effectiveness of MOOCs in developing global ocean literacy.

Keywords: ocean literacy, open education, MOOCs, online learning, distance learners

BACKGROUND AND RATIONALE

Almost 2.4 billion people live within 100 km of the ocean globally and they interact directly with the ocean on a regular basis (United Nations Ocean Conference, 2017). A significant proportion of all our resources originate from the oceans and the sustainability of these supplies is intimately linked to decisions made by individuals and society that stem from ocean literacy, defined as an understanding of the interactive and mutual impact of humans, society and the ocean environment. The Marine Biological Association of the United Kingdom describes an ocean-literate individual as one who “Understands[ing] the importance of the ocean to humankind, can communicate about the ocean in a meaningful way, and is able to make informed and responsible decisions regarding the ocean and its resources.” UNESCO defines ocean literacy as “the understanding of our influence on the ocean and the ocean’s influence on us. Ocean literacy is a way not only to increase the awareness of the public about the ocean, but it is as an approach to encourage all citizens and stakeholders to have a more responsible and informed behavior toward the ocean and its resources.

It is not just knowledge about the state of the ocean but a deeper understanding of our individual and collective responsibilities to take care of the ocean.”

The seven principles of ocean literacy (Ocean Literacy, 2013 and **Table 1**) are beginning to be used widely as a framework for development of an ocean-literate society. Ocean literacy leads to more informed participation in the discussion on the future of the oceans and more responsible and effective decision making (Fauville et al., 2018). Ocean literacy requires individuals to be empowered with knowledge and then inspired to act (McPherson, 2018 p. 20). These acts can involve communicating about the ocean in a meaningful way as well as making informed decisions about behavior changes at individual through to societal scales.

INTRODUCTION

Global learning formats such as massive open online courses (MOOCs) provide open access to information and increased interactions between researchers and global society (Visbeck, 2018) and thus have potential to reach large numbers of ocean literacy learners. Like many equivalent organizations, the University of Southampton has invested in online courses for a number of related reasons that include: enhancing on-campus delivery of innovative online experiences for students of all levels; promoting research and education strengths to a global audience; addressing accessibility and widening participation; internationalizing the student experience; offering lifelong and flexible learning; and fostering innovation and enhancement in the curriculum.

The University of Southampton has extensive institutional experience and expertise in the development and delivery of online education and since 2012 has been a partner with FutureLearn, one of the providers of MOOCs. Exploring Our Oceans is one of several courses that launched on the FutureLearn platform in 2014. The high-quality FutureLearn format provides a forum where learners and facilitators build a connected, global on-line community that not only links our geographically distinct campuses in the United Kingdom and Malaysia but our postgraduate facilitators and collaborators that are based around the globe in South Africa, United States or on ships in the middle of the ocean. These communities of learners are sustained long after the initial learning experience has ceased through adjunct activities such as blogs (> 300 reads per week), social media (~1000 followers), or enrolment in campus based programs (see below).

The original design brief for the Exploring Our Oceans MOOC was to raise awareness of deep ocean environments and human impacts on them, and enable public engagement with the University of Southampton's specific research in this area. This contribution therefore summarizes evidence of outcomes for participants that are consistent with enhancing ocean literacy, shares our experience of creating and delivering Exploring Our Oceans, and discusses the potential of MOOCs as an addition to the toolkit for building global ocean literacy.

MOOC PEDAGOGIES

The term x-mooc (Downes, 2012) refers to massive open online courses delivered via dedicated platforms and which are based primarily on behaviorist learning theory and didactic methods (Rodriguez, 2012). Course materials mainly consist of short videos and online quizzes. Conversely, learning in c-moocs “results not from the transmission of information from an expert to novices, but from the sharing and flow of knowledge between participants” (Bates, 2015, paragraph 5.3.2.1). c-moocs can be distinguished from x-moocs by the following design features: learner autonomy, diversity, interactivity, and openness (Downes, 2014).

The Meltzoff et al. (2009) study of infant and machine learning highlighted social learning as a powerful learning tool. This work was subsequently cited as “a catalyst for the creation of FutureLearn” (Future Learn, 2018, p.7). The three unpinning principles of FutureLearn pedagogy are telling stories, provoking conversation, and celebrating progress. There is a strong design emphasis on Conversation Theory, Active Learning and Social Learning. The underpinning pedagogies of the FutureLearn platform are naturally aligned to developing the ocean literacy skills. This relative newcomer to online learning platforms launched in late 2013 and has rapidly risen to a rating in the top six platforms, alongside originals such as Coursera and EdX.

However, other researchers caution that a binary view of design is less useful as greater numbers of these courses now incorporate features of both designs, and that MOOC pedagogies are more nuanced “[taking] account of ... a micro level of individual course design” (Bayne and Ross, 2014).

METHODOLOGY: EXPLORING OUR OCEANS COURSE DESIGN

The course was originally built around six consecutive weeks of study, later revised to 4 weeks after four runs of the course. In each week, learners are expected to undertake approximately 3 h of activity to complete core course materials, and the content for each week is organized around a specific theme (e.g., mapping and exploration; physical and chemical oceanography; marine biodiversity). Whilst learners can engage with the subject matter in any order they choose, the course team's online facilitators provide focused discussion and interaction with each “live” week of the course from the launch date. Traditional instructional techniques include video to explain key concepts, and weekly formative quizzes. Video is used to show rather than tell learners, however, making use of on location filming and practical demonstrations. At the end of each week there is a reflection activity, where learners share what they have learned, not necessarily aligned to the specific learning objectives for the course. How learners discuss, construct and share new understanding is therefore more aligned to c-mooc design. **Table 1** summarizes the seven Principles of Ocean Literacy, 2013 and maps those principles to specific aspects of the course design.

Week One of the course introduces learners to the history of ocean exploration, including the 1872–1876 *HMS Challenger*

TABLE 1 | Exploring our Oceans course design mapped against Principles of Ocean Literacy.

Principle	Course content	Course learning objectives
The Earth has one big ocean with many features.	Weeks 1, 2, 4	Assess the distribution of salt in the ocean
The ocean and life in the ocean shape the features of Earth.	Week 2	Identify key controls on seawater composition and circulation
The ocean is a major influence on weather and climate.	Week 2	Understand the impact of deep ocean processes on global climate through ocean chemistry and physics
The ocean made the Earth habitable.	Weeks 2 and 3	Understand the impact of deep ocean processes on the Earth system
The ocean supports a great diversity of life and ecosystems.	Weeks 1, 3, 4	Interpret Collector's Curves to estimate numbers of undiscovered new species Explain some adaptations to life in deep ocean habitats
The ocean and humans are inextricably interconnected.	Weeks 1, 4	Reflect on personal effectiveness in limiting potential impacts on deep ocean environments
The ocean is largely unexplored.	Weeks 1, 3, 4	Evaluate the degree to which humans have mapped the deep ocean and its habitats

expedition, and the extent to which modern mapping techniques have been used to map the ocean floor. Learners are also invited to share their motivations for joining the course through a specific activity “What do the Oceans mean to you?” The aim of the activity is to identify similar and different viewpoints in the learner cohort, as well as a qualitative measure of impact (the same activity is repeated in the final week of the course). Learners share an image on a virtual notice board; over time these images have been collated into a mosaic which is shared with learners and the wider public. By asking learners to share their personal perspectives at the beginning of the course, the learning design puts the focus on individual journeys, a feature which is typical of c-moocs. This c-mooc feature is also used when the cohort explores a small section of the sea floor for themselves using an interactive map and research data from the academic team.

Week Two introduces learners to ocean circulation and seawater composition. The week's design and content strongly reflects an x-mooc model: that of traditional dissemination of information from lecturer to students. This is mostly due to the key concepts involved, such as movement of ocean currents, gyres, and tides, and chemical composition of seawater and residence time of the various components. We have augmented this delivery with activities designed to encourage learner to learner conversation. In doing so, these concepts become more relevant to learners on an individual level and therefore more likely to lead to deeper learning through personalization and grounding (Priniski et al., 2018). A particular example of this in the course design is a section about the composition of seawater. After watching a series of three instructional videos about why the sea is salty, where the salt comes from, and where it goes to, learners are asked to calculate the volume of salt in the ocean. This step of the activity is optional; offering a challenge for more confident learners. To engage with less confident learners and provide relevant, meaningful connections for the whole cohort, the next step provides the answer and invites learners to share their own comparisons, such as the one shared by Learner A, below.

Learner A

A red double decker bus in London is on average 4.8 m tall, this means the layer of salt that would be left on the sea floor if the water evaporated would be just over 12 and a half busses deep. . .this really gives me a great perspective of just how much that is!

Week Three focuses on biodiversity in the oceans, from microbes to large animals, and includes insights into the process of discovering and describing new species, and an overview of adaptations to deep-ocean environments. In this week the x-mooc course delivery is enhanced by directing learners to live online streaming of deep-sea remotely operated vehicle footage from research expeditions at sea, such as the NOAA Ocean Exploration Program and the Ocean Exploration Trust.

The final week of Exploring Our Oceans focuses on human impacts on the deep ocean, with content that has required the most updating on a regular basis, to keep pace with growing research into the potential environmental impacts of future deep-sea mining, and international environmental policy developments. In late 2015, the United Kingdom introduced charges for single use plastic bags, and public awareness of the environmental impacts of single use plastics has continued to grow, with further United Kingdom initiatives such as bans on microbeads (2018) and planned bans on drinking straws, drinks stirrers and cotton buds (2019–2020). We incorporated new material on ocean plastics into this section in 2016, responding directly to learner interests and public debate. The final week of the course offers significant opportunity to engage with learners about their ocean literacy and personal effectiveness regarding ocean citizenship. We therefore have focused our thematic, qualitative analysis on learner comments posted during this final week of learning.

IMPACT/LEARNER CASE STUDIES

Since its inception in February 2014, Exploring our Oceans has run ten times. In total, more than 40,669 learners have signed up to the course in 183 of 195 countries around the world. Course sign-ups have translated into approximately over half (22,894) of those participants recording their engagement with course materials. The FutureLearn platform invites participants to indicate that they have completed steps in the course content, but recording the completion of a step is not required for participants to progress to other steps, and data on steps completed are therefore a minimum estimate of engagement with course materials. A significantly smaller proportion of participants recorded their completion of the course (12.5%), but

this is still above average for MOOC completion rates of 5–10% (Chuang and Ho, 2016), and such metrics are controversial in terms of evaluating both learner and course success (Devlin, 2013; Jordan, 2014).

The impacts of the Exploring our Oceans MOOC include increased awareness of, and attitudes to, ocean issues; increased applications to undergraduate and postgraduate programs; development of communication and outreach skills in the Southampton postgraduate community, and partnership building with Nelson Mandela University, South Africa. Evidence for ocean literacy enhancement is provided by a follow-up interview study conducted with learners after the first run of the MOOC (Wintrup et al., 2015), and thematic analysis of a large number of comments posted by learners during the final week of the 4 weeks course.

Initial Quantitative Survey Data

Wintrup et al. (2015) undertook post-course interviews with 453 learners from the first run of the Exploring Our Oceans MOOC, as part of a wider study assessing the learning styles followed in MOOCs. The interview questionnaire, however, captured evidence relevant to ocean literacy goals and public engagement with research, asking participants to assess the extent to which they “learned something that changed the way I understood an issue,” “felt an informed citizen,” and “learned about the results of current research.”

Out of the 453 learners interviewed, 100% reported learning about the results of current ocean research “sometimes” or more frequently during the MOOC, with 48% reporting that they did so “very much” (Wintrup et al., 2015). Ninety-seven percent reported that they had learned something during the MOOC that changed the way they understood an ocean issue, with 28% responding that they did so “very often” during the course (Wintrup et al., 2015). Meanwhile, 89% reported feeling that they were becoming more informed citizens sometimes or more frequently during the MOOC, with 17% doing so “very much” (Wintrup et al., 2015). Below we supplement this quantitative analysis with thematic analysis and specific quotations from learners to demonstrate the alignment with the principles of ocean literacy.

Qualitative Data From Learner Comments

More than 41,679 comments have been posted by learners and online educators across all the course runs. This significant source of qualitative data is still being processed, but an initial thematic analysis of a subset of learner comments is presented here. For this study, comments in the final week of the course from the last four runs of the course are considered, representing a total of 1,867 comments. The course format was reduced from 6 weeks (Run 1–4) to 4 weeks (Run 5–current form) so only the 4 weeks versions are included in the data set for consistency. These comments do not represent individual learners as many make multiple comments. It is beyond the scope of the current study to investigate individual commentaries/narratives. A single comment can include content relevant to multiple themes. The

final week of each 4-week run was selected for analysis due to the reflective nature of the discussions and summary activities. FutureLearn’s legal team have reviewed and approved this use of anonymised Learner comments with respect to terms and conditions of using the platform. This work has been conducted in accordance with the University ethics policy and values and conforms with the principles laid out in other relevant policies, guidelines and codes of conduct.

Five emerging themes around how ocean literacy can be developed through a MOOC are presented in **Table 2** below; progressing from individual engagement with concepts through to communicating and sharing new understanding more broadly across society. These themes are illustrated below with quotes from learners.

The themes are outlined below and each description is accompanied by anonymised and illustrative learner comments.

Theme 1: Developing Individual Literacy

Literacy that results from internal reflection and sharing with the rest of the cohort is common in the end of week activities, but also predominates in the final week of the course. Frequently individual literacy relates to new knowledge or understanding of key concepts in Ocean Principles, but also includes increased personal awareness of one’s own actions. Where learners explicitly expressed a change in their knowledge or behavior as a direct result of the course, these comments are included in this theme. In significantly more comments, learners discussed sustainable actions but may have been engaging in these prior to their learning.

Learner B

“Some of the most striking points to takeaway... The importance of “acoustics” of Whales, Dolphins and Invertebrates Definition of the different ocean “zones”

Anthropogenic new vocabulary...”

Learner C

I now see the oceans as much larger and more diverse than I did before. I had very little knowledge of the sea floor and the vast number of organisms living there. I have gained a better understanding of how important the oceans are for the health of the whole planet, and the importance of exploiting them in a sustainable manner.

Learner D

I currently live in [location removed] and here we don’t even sort our rubbish for recycling (not even paper and glass etc.). I will make an effort to try and bring about some change to this litter-friendly attitude. From now on I will also always carry around a reusable bag instead of relying on the odd plastic bag. . . . I hope to help in every way that I can.

Theme 2: Developing Literacy in Formal Education Contexts

A small but regular demographic of learners in each run are educators themselves. These participants report that they use the course materials in at least two ways: developing their own knowledge prior to teaching the subject, or alongside their students as an extension of the classroom. In a 2017 run of the course, the cohort included a class of high school students

TABLE 2 | Emerging themes of developing ocean literacy in the Exploring our Oceans MOOC (runs 5–10, 4-week version only).

Course run	Total number of comments in final week	Theme 1 (number of comments)	Theme 2 (number of comments)	Theme 3 (number of comments)	Theme 4 (number of comments)	Theme 5 (number of comments)
5	560	85	8	1	10	0
6	732	70	2	2	8	1
7	596	95	13	5	10	1
8	606	62	10	5	12	0
9	285	21	2	0	2	0
10	380	26	10	3	5	1

from Mexico whose comments and interactions indicated that they were studying with one of their teachers. Home-schooled children also access the course materials whilst supervised by parents. The cohort of learners on the MOOC is very diverse in terms of educational backgrounds, and frequently more experienced learners will help less confident or knowledgeable peers. When learner comments indicated that the individual was engaged in a classroom or home-schooled setting, or a learner had been acknowledged for providing support, the comment was included in this theme.

Learner E

Hello! I am a primary school teacher and I would like to know more about life in the ocean and influence its care and preservation through my students.

Theme 3: Developing Cross-Generation Literacies

FutureLearn has identified seven different learner “archetypes” that can be used to classify participants –Advancers, Preparers, Explorers, Flourishers, Fixers, Hobbyists, and Vitalisers. Whilst some online courses focus on professional development opportunities, others attract lifelong learners and a higher proportion of older or retired individuals who study for personal interest. Exploring our Oceans is one such course; and these learners are likely to share their new knowledge with their families.

Learner F

Living very near the sea I wanted to know more. Now I will do some of the little helpful things and try to keep at least my little patch clearer of debris and teach my children and grandchildren to be more responsible in their use of plastics and other unhelpful items.

Learner G

Living in a landlocked country [location removed] oceans are the big, mysterious waters for me, always fascinating and inviting to explore. My son (7,5) is really interested in anything that covers geography/biology, so we'll follow this course together...

Theme 4: Developing Wider Community Literacies

When learners indicated via comments that they were sharing links to course materials, or discussing the course and their new knowledge with people who were external to the course cohort, this appears in the theme of developing wider community literacies. This may be in the context of informal conversations with individuals,

or with specific groups such as local voluntary clubs etc. The current thematic analysis distinguishes between the sharing of pre-existing course materials, and learners creating new resources themselves (see next section) which they then share online.

Learner H

This fourth week of a brilliant course is, I think, so important that I am copying URLs and posting on Facebook pages of several groups and friends. With acknowledgment of this course...

Theme 5: Creating New Resources for Developing Ocean Literacy in Others

Throughout the course learners are encouraged to share their knowledge and understanding with others. The “visualizing large numbers” activity in Week two is one example of such deliberate design, which enables participants to help each other comprehend the scales involved (Learners I and J). No specific direction is given in the activity instructions, but sometimes learners extend the sharing of these resources in other social platforms that they use habitually (Learner K).

Learner I

If you filled your bathtub with seawater it would contain approx. 2.8 kg of salt. (If it is an average bathtub that can hold up to 80 liters of water).

Learner J

Brilliant. Thank you [Learner I]. An excellent example on a scale I can relate to.

Learner K

Design complete and uploaded photo of drawing onto Instagram and will put one on Facebook.

In later course runs there was an increase in learners conveying a strong sense of civic duty to share their new literacies with others. Individual changes in behavior are commonly reported, with evidence that learners encourage each other to engage in beach cleans and citizen science projects. The course leaders and facilitators play an important role in providing guidance and options in how to engage with (or support) the scientific research community, local environmental communities and politicians and how to lobby government policy developers.

Learner L

I have always been an observer of the sea. With this MOOC, I feel like a “citizen of the oceans.”

Learner M

My starting attempt - please hack around:

The world's oceans are the foundation of life, and as such should be protected, nurtured and only used as a resource after careful and measured scientific review. As a fellow of this course, and someone who cares about the oceans of the future - I pledge three simple things:

- (1) To recycle and avoid single use non-recyclables plastics.*
 - (2) To make my use of fish an ethically based choice.*
 - (3) To share my love and passion for the oceans, and encourage others to follow this pledge.*
- Signed.....*

In the most recent run of the course, one learner created a pledge for peers to sign up to and share. This will be incorporated as course material into the next run and evidences a growing community of practice between learners and educators.

DISCUSSION AND RECOMMENDATIONS

Thematic analysis of the learner comments from the final week's activity provides insights into the level of ocean literacy achieved by engagement with the Exploring our Oceans MOOC. Combined with previous quantitative survey data, there is evidence for individual learning outcomes that are aligned to all seven ocean literacy principles. Higher levels of literacy, such as sharing of knowledge with others is evidenced through learner comments (themes 2–4), and the highest level (theme 5) is only occasionally evidenced in our analysis.

The combination of innovative course design based on research materials, strong educational foundations in oceanography, and the FutureLearn platform ensures free and ready accessibility for an international online audience who are able to follow course materials in English. Exploring Our Oceans has supported a diverse range of learners of all ages, with very different life experiences (Urrutia et al., 2016), and reached a global audience with wide range of motivations for taking the course, as evidenced by their feedback and continued engagement via our MOOC blog¹. After an initial investment in the development of the first version of the MOOC, the delivery of Exploring Our Oceans is now financially sustainable with revenue streams from learner “upgrades” (extended access to course materials) which are paid jointly to FutureLearn and the University of Southampton providing funding for course facilitation by Southampton Ph.D. students.

One of the key design principles used during course development was ease of access to material online and accessibility of the material developed within the MOOC; this was designed in partnership with FutureLearn principles for delivery (Sharples, 2015). Each week involves a number of steps that develop learning in a sequential manner from knowledge acquisition through to experiential engagement in specific activities, communication of outcomes, and interactions with advanced level online research resources. Clear signposting of the learner journey means that individuals can extend their learning to greater depths if desired, or move to new areas

instead. Feedback from each cohort suggests that this approach allows a wide range of learner backgrounds and expectations to be accommodated simultaneously in the same online platform. Specific lessons learnt have been incorporated into subsequent course runs and this continuous improvement allows learners to repeat the course and past learners to participate as facilitators as individuals further develop their ocean literacy.

Surveys of our students currently enrolled at the University of Southampton reveal that more than 250 have taken this free online course prior to joining the University. Feedback from this cohort provides evidence that the access to high quality and engaging learning materials was one of the key elements informing their decision to study at Southampton. Applications to marine biology and oceanography undergraduate programs at the University have increased by 30% in the 3 years from 2016 entry to 2018 entry, and although there are multiple reasons for application fluctuations, these figures are set against the background of a demographic dip in University-age individuals in the United Kingdom. Several of our Ph.D. students have taken the MOOC prior to applying to Southampton and subsequently participate in the course as postgraduate facilitators. Both undergraduate and postgraduate students (and their parents) are consistently positive about the online learning experience and recommend the course to future learners; demonstrating their acquired ocean literacy skills.

More than 35 postgraduate students, and other staff, have facilitated the online learning environment over the last 4 years. Each subsequent cohort of facilitators includes a mixture of experienced facilitators and new postgraduates. Peer-to-peer support, supplemented by training and mentoring from the MOOC leads, ensures high quality and authentic facilitation. Tutor engagement and sensitive moderation of online discussion fora are essential for learner success and this is one of the most important practical implications for those planning to use online learning to enhance ocean literacy. Tutors and facilitators answer questions, facilitate discussions, nudge learners to explore further and share learning experience. Naturally the online discussion needs occasional moderation to remove inappropriate posts, make factual corrections to inaccuracies, and to update online links. Our Ph.D. students develop their public engagement skills and facilitation confidence via asynchronous discussion of sometimes emotive subjects (e.g., sustainable use of the oceans, deep-sea mining, plastic use and pollution of the oceans) that arise throughout the course within the learning community (Urrutia et al., 2016). Our Ph.D. facilitators are all demonstrating high level ocean literacy skills through their sensitive facilitation to discussion, development of new learning materials on the course blog and other social media platforms.

One of the significant benefits for all learners and postgraduate facilitators is the exposure to online discussion fora where cohort peers with different cultural perspectives share their experiences. These can be factual observations of the ocean environment or experience from close to home in different environments, or more ocean literate views and ideas from different cultural perspectives. We have had learners who are overwintering on an Antarctic Base, learners who are based in small island states devastated by hurricanes, and learners who

¹<http://moocs.southampton.ac.uk/oceans>

have never previously seen the sea. We have not yet analyzed cultural or geographical differences in the learner commentaries, and this element of analysis over the full ten cohorts could expose cultural and regional variations in ocean literacy and its development in the future.

The growth of MOOCs provided by higher education institutions in the early 2010s was partly driven by their perceived potential for increasing access to formal qualifications and continuing professional development (Yuan and Powell, 2013), particularly for learners in developing countries, but on-campus delivery remains the dominant mode of pedagogy at most universities. MOOCs have provided a medium for less formal “lifelong learning,” however, and public engagement with research where MOOC content is research-led. In that context, the outcomes recorded from learner engagement in the Exploring Our Oceans MOOC demonstrate the potential of MOOCs as an important tool to help achieve ocean literacy goals as well as providing a number of other direct benefits to the organizations involved in their development and delivery. There is significant potential to accelerate ocean literacy and amplify the reach of our

MOOC when learners themselves develop new resources to share with their communities. This will be our aim in future runs of Exploring our Ocean.

ETHICS STATEMENT

This study is exempt from ethics review as the research is based on studies of public behavior that are purely observational (non-invasive and non-interactive). The research has been conducted in accordance with accepted ethics standards as data have been anonymised.

AUTHOR CONTRIBUTIONS

All authors contributed to conception and design of the study, wrote sections of the manuscript and contributed to the manuscript revision, read and approved the submitted version. SF organized and analyzed the data.

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Conflict of Interest Statement: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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