

SEA CHANGE



OUR OCEAN | OUR HEALTH

Our European Ocean Conversations Summary Report

Report Prepared By

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Sea Change

Our European Ocean Conversations Summary Report



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The Context

European citizens are not aware of the full extent of the medical, economic, social, political and environmental importance of the sea to Europe and indeed to the rest of the world. Many of us are not aware that our day-to-day actions can have a cumulative effect on the health of the ocean and seas – a necessary resource that must be protected for all life on planet earth to exist.

In other words, European citizens lack a sense of 'Ocean Literacy' - an understanding of the oceans influence on us and our influence on the ocean. An ocean-literate person:

- understands 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.

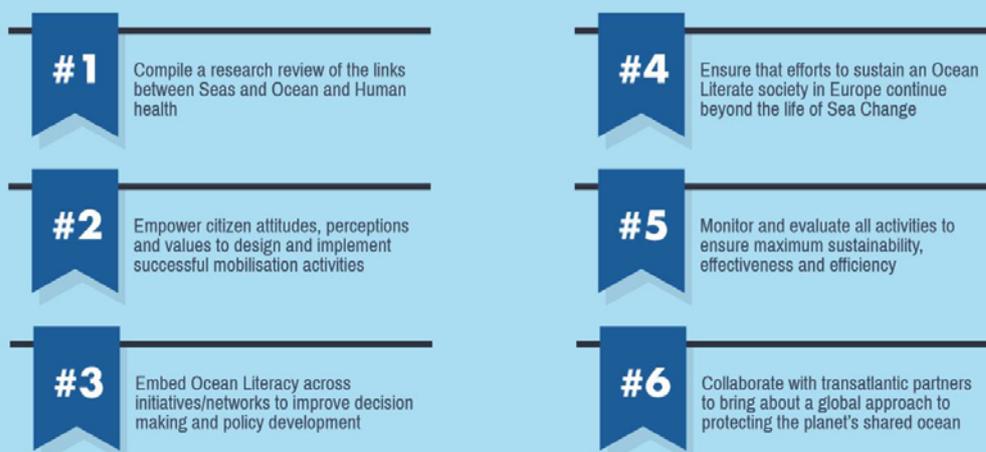
The Galway Statement on Atlantic Ocean Cooperation (2013) reinforced this need for Ocean Literacy in Europe. In Galway, top marine scientists from Europe, the US and Canada identified convergences between their respective scientific agendas. They concluded that together they could build a capacity to understand and predict major Atlantic and Arctic processes, in addition to identifying proposed changes and highlighting the risks they carry in relation to human activities and climate change. The goals are to better understand the Arctic and North Atlantic and to promote the sustainable management of its resources. The work also studies the interplay of the Atlantic Ocean with the Arctic Ocean, particularly with regards to climate change. Five areas of cooperation were identified as priorities in the policy dialogue both with the US and Canada and are part of the Galway Statement commitments:

- Ocean Stressors (e.g. ocean acidification)
- Aquaculture
- Observing Systems
- Marine Microbial Ecology and
- Ocean Literacy

The Sea Change Project

Sea Change is designed to bring about a fundamental 'Sea Change' in the way European citizens view their relationship with the sea, by empowering them as Ocean Literate citizens to take direct and sustainable action towards healthy seas and ocean, healthy communities and ultimately, a healthy planet.

The key goals of Sea Change are to:



How Sea Change will Co-Create Ocean Literacy

By using the concept of Ocean Literacy, Sea Change creates a deeper understanding of how the health of European citizens depends on the health of our ocean. While education and traditional advertising can be effective in creating awareness, numerous studies [1] document that behaviour change rarely occurs as a result of simply providing information, but through initiatives delivered at the community level focusing on removing barriers to an activity and therefore enhancing the activity's benefits. Sea Change brings about real actions using behavioural and social change methodologies. These actions will be assessed for their effectiveness over the lifetime of the project which, in turn, will allow the project to improve its techniques and spread a 'Sea Change' movement across Europe.

Our European Ocean Conversations

Our European Ocean Conversations are about collaboration, empowerment and direct active engagement with invited stakeholders involved in teaching, education, outreach, curriculum, regulation and policy decisions. Our European Ocean Conversations are about speaking and listening to people on their own terms. Our conversations go significantly beyond just asking people for their opinions or what might be called 'participation by consultation'. It gives invited stakeholders a voice about the barriers to change and ownership and responsibility for solutions to influence their welfare, together learning how to create an ocean literate society [2].

This report is a summary of eight individual reports, describing the key findings from Ocean Conversations which have taken place across Europe. Our European Ocean Conversations took place in Ireland, Sweden, Belgium, Denmark, Greece, Portugal, Spain and the United Kingdom. Our European Ocean Conversations aimed to:

1. Hear about the challenges ahead for teaching about the oceans
2. Learn from others about the pathways forward for an ocean literate Europe
3. Develop creative solutions and options for the successful integration of ocean knowledge into the education and outreach curricula

Our Conversations Process

Collective Intelligence (CI) is a methodology which facilitates group discussion and consensus building. Within conversations, participants from different backgrounds and sectors work collaboratively to reach a consensus on how best to address a complex issue, in this case teaching 12-19 year olds about the ocean. CI encourages participants to design resolutions through reflective negotiations and voting for strategies that are perceived to have the greatest impact and influence.

In a typical CI session, participants with expertise and insight into a problem engage in: (a) developing an understanding of the situation, (b) establishing an integrative basis for thinking about the way forward and (c) producing a strategic framework for effective change [3]. The facilitation of CI conversations takes into account the contextual factors that may impact on group work by integrating the influence of culture into the discussion. It also benefits the researcher, as the sessions provide deeper insights into how attitudes are influenced by group work itself [4]. This conversation was conducted with marine experts within the domain of ocean literacy education and outreach.

The CI conversations process centred around four stages, used to collect data [5,6]. The same stages were used in all eight European conversations and are summarised in Figure 1.

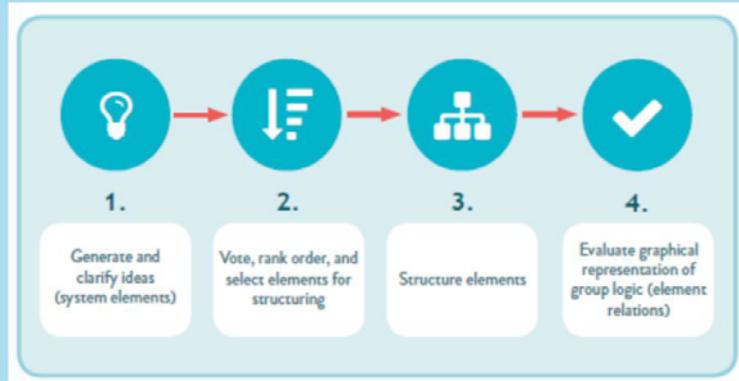


Figure 1 - Summary of the Collective Intelligence Conversation Process

(1) Online Idea Generation

Participants across Europe were asked the same trigger question for Our European Ocean Conversations: "What are the barriers to teaching 12-19 year olds about the ocean?" This age range was chosen to be inclusive of the second level schools throughout Europe. This question was asked online via email where participants were given the opportunity to reflect on the question and think of as many barriers as possible. Each participant was then given the opportunity to clarify each barrier using a clarification sentence. In total, participants generated 657 barriers.

(2) Idea Categorisation

Once idea generation was completed online, the CI facilitation teams across Europe began the categorisation process. The first eight barriers were placed separately on boards and all other barriers were compared with them. In this process referred to as paired comparison, barriers that were deemed similar to each other were grouped together. Once at least five barriers were grouped together, the internal working groups labelled the category. In total, 71 categories were produced across Europe. On the day of the conversation, participants became involved in the categorisation process when they were asked to review the barriers and categories. Following the review, if participants felt that some barriers would be more appropriate in another category, they were given the opportunity to move them. The proposed category amendments were discussed with the group and the re-categorisation of individual barriers and category labels were made when a group consensus was reached. Once idea categorisation was complete, participants engaged in a voting process to identify the most important barriers.

(3) Structuring Barriers (Elements)

The 95 barriers that received the highest votes in each country (15 Ireland + 11 Sweden + 12 Belgium + 12 Denmark + 12 Greece + 11 Spain + 11 Portugal + 11 United Kingdom) were entered into the Interpretative Structural Modelling (ISM) software, where a series of relational questions, "Does Barrier A significantly aggravate Barrier B?" were asked to the stakeholders. A yes/no vote was taken and entered in the ISM software. Structuring continued until all relational barriers were voted upon and structural barrier maps were generated.

(4) Generating Options

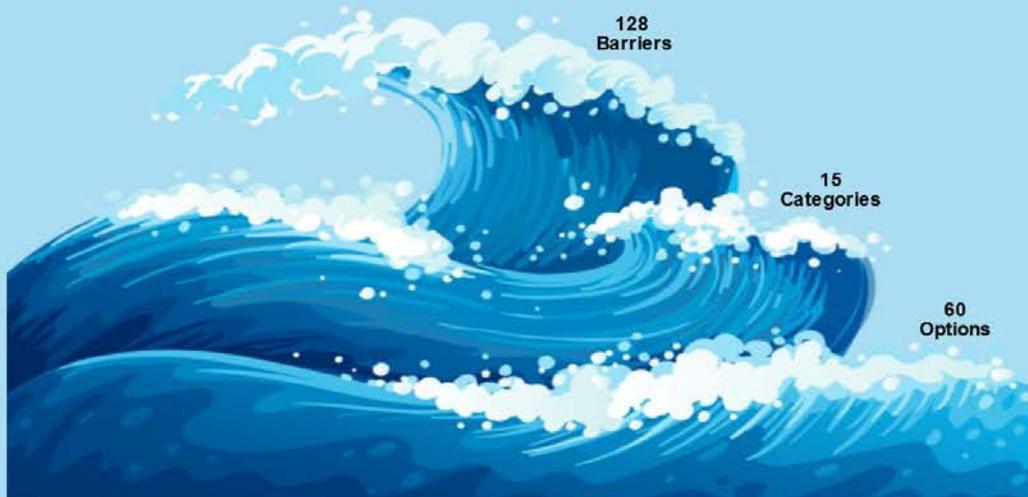
To conclude the CI conversations, stakeholders were divided into sub-groups, to work with two categories from stage 2. They were provided with the facilitation question: "What are the options for overcoming the barriers in the [category title]?" and asked to explain their solutions with the entire group. In total, 316 options were proposed. All stakeholders then discussed and voted for the proposed options they perceived to be the most feasible, impactful and timely in each category.

Our European Ocean Conversations took place between April 4th and May 25th 2016.

The Results - Ireland

Our Irish Ocean Conversation took place on the 19th of May in the Promenade Suite in the Salthill Hotel in Galway. Fourteen stakeholders who were identified as experts in their respective fields represented sectors involved in teaching, education, outreach, curriculum, regulation and policy decisions in our conversation. Eleven further stakeholders contributed to stage 1: online idea generation stage leading to a total number of twenty-five stakeholders involved in Our Irish Ocean Conversations.

Our Irish Ocean Conversations resulted in the generation of:



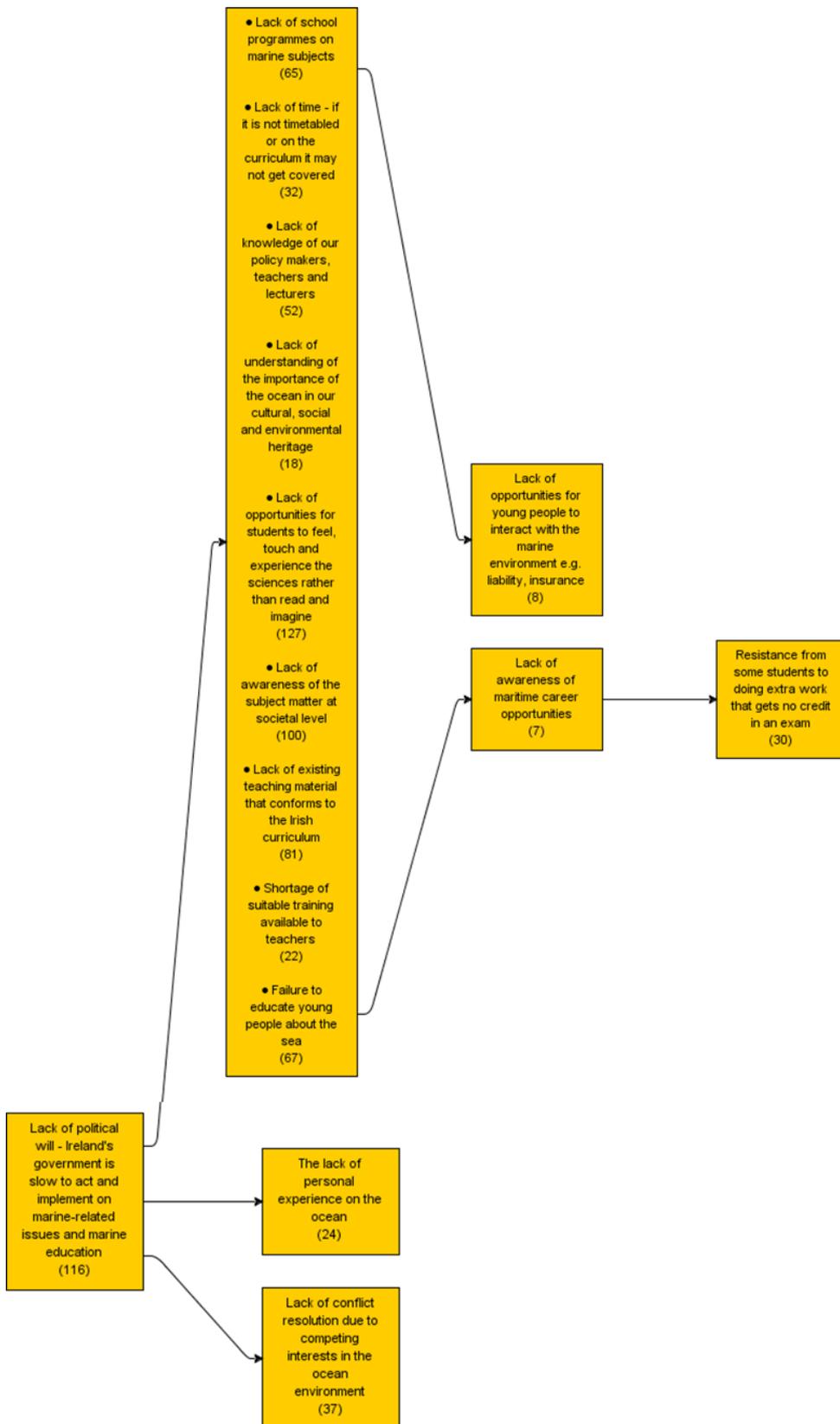
The top most voted for barriers to teaching 12-19 year olds about the oceans in Step 2 were:

- ⚓ Lack of school programmes on marine subjects (18 votes)
- ⚓ Lack of political will - Ireland's government is slow to act and implement on marine-related issues and marine education (16 votes)
- ⚓ Lack of knowledge of our policy makers, teachers and lecturers (15 votes)
- ⚓ Shortage of suitable training available to teachers (12 votes)
- ⚓ Lack of understanding of the importance of the ocean in our cultural, social and environmental heritage (11 votes)
- ⚓ Lack of conflict resolution due to competing interests in the ocean environment (11 votes)

The most voted for options in Step 4 were:

- 🌊 Making World Ocean Day a community event / linking in with a national one day school event (15 votes)
- 🌊 National media (all) campaign for all aquatic interests and activities – commercial + leisure (14 votes)
- 🌊 Dedicated self-funded marine department [with Secretary General (SG) from worldwide human resources market] (13 votes)
- 🌊 Certificate for T.Y. students from National Governing Body (NGB) in ocean literacy. This should lead on to more work experience in the maritime industries (11 votes)
- 🌊 Change or incorporate aquatic education into relevant curricula e.g. history, geography, biology, chemistry etc. (10 votes)

The structural barrier map developed within the Irish stakeholder conversation during Step 3 is shown in Figure 2.



The structural barrier map is the most tangible output from Our Irish Ocean Conversations.

This structural barrier map is read from left to right with the barriers to the left significantly aggravating the barriers to the right.

For example, 'Lack of political will - Ireland's government is slow to act and implement on marine-related issues and marine education' significantly aggravates 'The lack of personal experience on the ocean'.

The nine barriers grouped together in the same box, such as 'Lack of school programmes on marine subjects', 'Lack of awareness of the subject matter at societal level' and 'Failure to educate young people about the sea' are reciprocally inter-related and they significantly aggravate one another.

Four different barrier aggravation pathways are evident in Figure 2, with directional arrows indicating aggravating pathways.

The numbers beside each of the barriers corresponds to when it was inputted into the computer software.

Figure 2 - Structural Barrier Map from Our Irish Ocean Conversations

The Results - Sweden

Our Swedish Ocean Conversation took place on the 4th of April at Pedagogen - House B in Gothenburg, Sweden. Sixteen stakeholders who were identified as experts in their respective fields represented sectors involved in teaching, education, outreach, curriculum, regulation and policy decisions in our conversation. Eleven further stakeholders contributed to stage 1: online idea generation stage leading to a total number of twenty-seven stakeholders involved in Our Swedish Ocean Conversations.

Our Swedish Ocean Conversations resulted in the generation of:



The top five most voted for barriers to teaching 12-19 year olds about the oceans in Step 2 were:

- ⚓ Lack of role models and that a sufficient number of adults set a good example (23 votes)
- ⚓ Inability to see their own daily choices in a larger perspective (17 votes)
- ⚓ The municipality's inability to collaborate on opportunities that allow students to be taught about the sea as part of their education (11 votes)
- ⚓ Insufficient use of interest and knowledge-provoking educational tools and teaching context of the ocean's importance to our planet (9 votes)
- ⚓ Lack of knowledge on how to work with the sea to meet curriculum requirements (9 votes)

The most voted for options in Step 4 were:

- 🌊 Further development for teachers and principles in "desire to create" activities (20 votes)
- 🌊 Build a personal relationship with the sea through interactive learning - where does the fish finger come from (16 votes)
- 🌊 Use real examples to work with - education should be connected to real projects (16 votes)
- 🌊 Introduce outdoor pedagogy and intersectoral teaching in teacher training programmes (14 votes)
- 🌊 Develop collaboration with other schools, universities and non-profit organisations (14 votes)

The structural barrier map developed within the Swedish stakeholder conversation during Step 3 is shown in Figure 3.

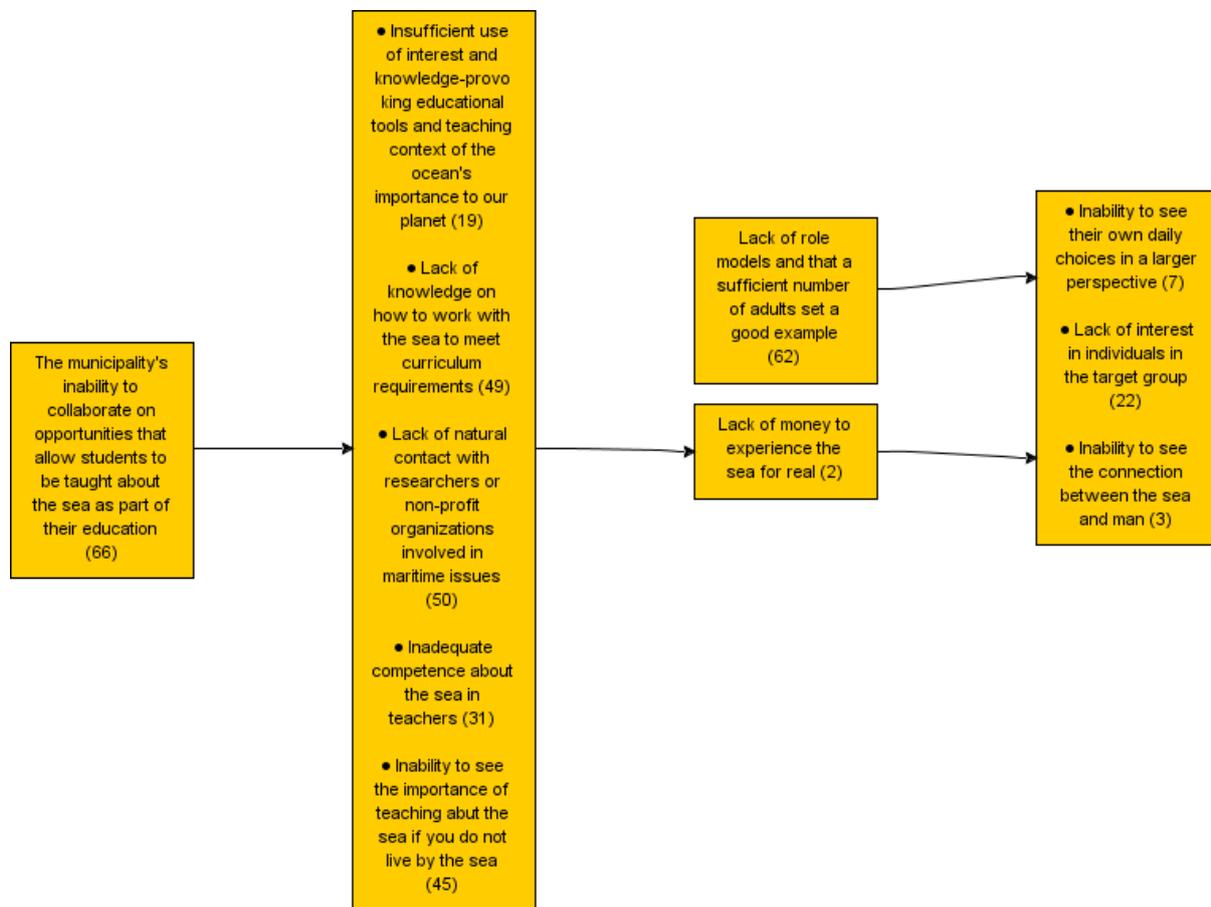


Figure 3 - Structural Barrier Map from Our Swedish Ocean Conversations

The structural barrier map is the most tangible output from Our Swedish Ocean Conversations. This structural barrier map is read from left to right with the barriers to the left significantly aggravating the barriers to the right.

For example, 'The municipality's inability to collaborate on opportunities that allow students to be taught about the sea as part of their education' significantly aggravates 'Insufficient use of interest and knowledge-provoking educational tools and teaching context of the ocean's importance to our planet', 'Lack of knowledge on how to work with the sea to meet curriculum requirements', 'Lack of natural contact with researchers or non-profit organizations involved in maritime issues', 'Inadequate competence about the sea in teachers' and 'Inability to see the importance of teaching about the sea if you do not live by the sea'.

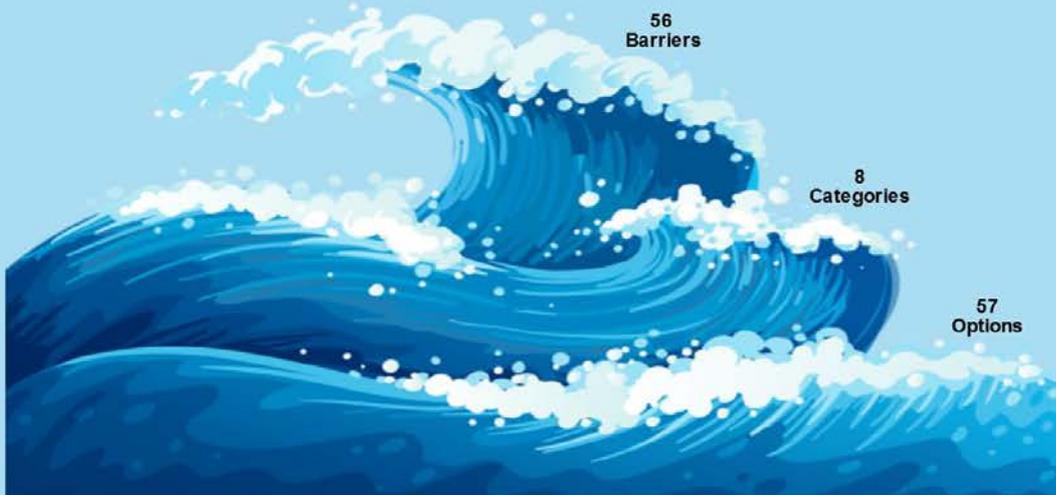
The five barriers grouped together in the same box, such as 'Insufficient use of interest and knowledge-provoking educational tools and teaching context of the ocean's importance to our planet', 'Lack of knowledge on how to work with the sea to meet curriculum requirements', 'Lack of natural contact with researchers or non-profit organizations involved in maritime issues', 'Inadequate competence about the sea in teachers' and 'Inability to see the importance of teaching about the sea if you do not live by the sea' are reciprocally inter-related and they significantly aggravate one another.

Two different barrier aggravation pathways are evident in the Swedish Structural Barrier Map in Figure 3, with directional arrows indicating aggravating pathways.

The Results - Belgium

Our Belgian Ocean Conversation took place on the 20th of May at the InnovOcean Site in Ostend in Belgium. Eight stakeholders who were identified as experts in their respective fields represented sectors involved in teaching, education, outreach, curriculum, regulation and policy decisions in our conversation. Seventeen further stakeholders contributed to stage 1: online idea generation stage leading to a total number of twenty-five stakeholders involved in Our Belgian Ocean Conversations.

Our Belgian Ocean Conversations resulted in the generation of:



The top five most voted for barriers to teaching 12-19 year olds about the oceans in Step 2 were:

- ⚓ Inability (of students) to consider longer timescales (8 votes)
- ⚓ No curriculum objectives (8 votes)
- ⚓ Ignored in (curriculum of) teacher training (8 votes)
- ⚓ Little visibility/accessibility to resources - not in textbooks (6 votes)
- ⚓ Lack of attention from the media for the Ocean (6 votes)

The most voted for options in Step 4 were:

- 🌊 Lobby with Ministry of Education for one or more curriculum goals on the ocean
- 🌊 Collaborate with teacher training to develop resources and vice versa offer field work to students in teacher training
- 🌊 Develop an overall ocean campaign to get more attention of the media for the ocean

The structural barrier map developed within the Belgian stakeholder conversation during Step 3 is shown in Figure 4.

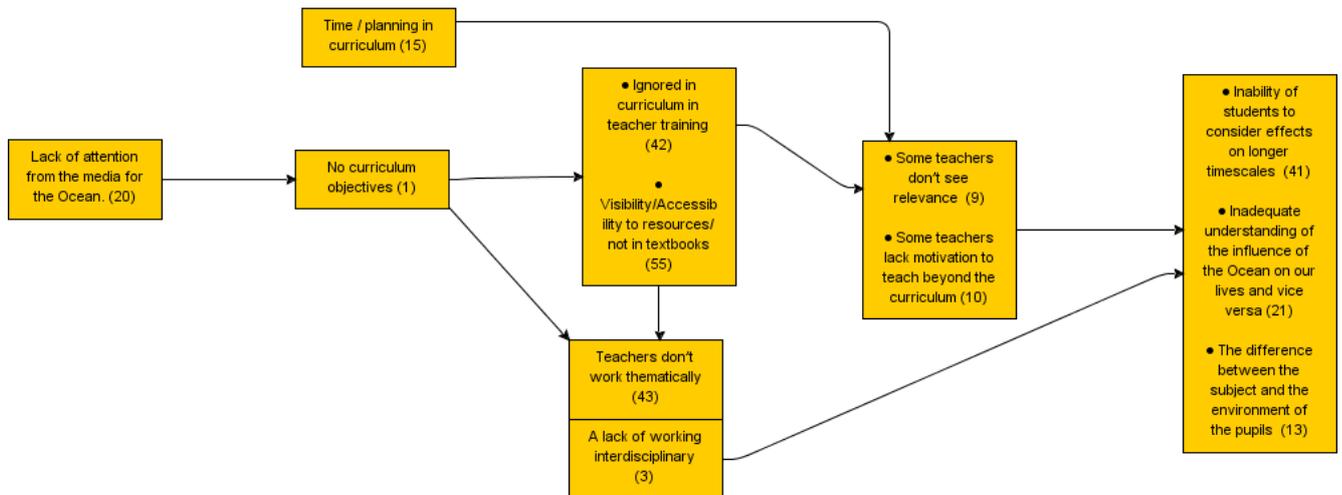


Figure 4 - Structural Barrier Map from Our Belgian Ocean Conversations

The structural barrier map is the most tangible output from Our Belgian Ocean Conversations. This structural barrier map is read from left to right with the barriers to the left significantly aggravating the barriers to the right.

For example, 'Lack of attention from the media for the Ocean' significantly aggravates 'No curriculum objectives'.

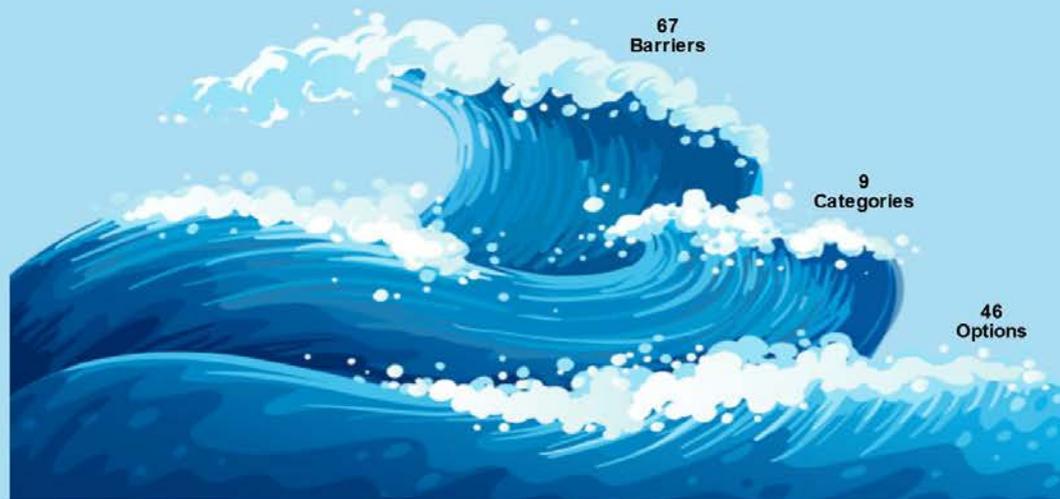
The three barriers grouped together in the same box, such as 'Inability of students to consider effects on longer timescales', 'Inadequate understanding of the influence of the Ocean on our lives and vice versa' and 'The difference between the subject and the environment of the pupils' are reciprocally inter-related and they significantly aggravate one another.

Three different barrier aggravation pathways are evident in the Belgian Structural Barrier Map in Figure 4, with directional arrows indicating aggravating pathways.

The Results - Denmark

Our Danish Ocean Conversation took place on the 19th of May at the Danish Shellfish Centre, DTU Aqua in Denmark. Twelve stakeholders who were identified as experts in their respective fields represented sectors involved in teaching, education, outreach, curriculum, regulation and policy decisions in our conversation. Sixteen further stakeholders contributed to stage 1: online idea generation stage leading to a total number of twenty-eight stakeholders involved in Our Danish Ocean Conversations.

Our Danish Ocean Conversations resulted in the generation of:



The top six most voted for barriers to teaching 12-19 year olds about the oceans in Step 2 were:

- ⚓ Lack of political focus on marine teaching (16 votes)
- ⚓ Lack of ability for people in general to understand the sea as a nature that should be cared for (15 votes)
- ⚓ The sea is not prioritized (13 votes)
- ⚓ Lack of teaching time (10 votes)
- ⚓ The sea (itself is a barrier) (10 votes)
- ⚓ Lack of resources for excursions (10 votes)

The most voted for options in Step 4 were:

- 🌊 Meaningful stories that the students can relate to (developed for the target group) (11 votes)
- 🌊 Create attention about the sea via media/lobbyists (11 votes)
- 🌊 External teaching can make the class more alive (10 votes)
- 🌊 Teaching 12-19 year olds about the ocean should be more prioritized on a political level (education ministry) in common goals/teaching plans (interdisciplinary dimension)(10 votes)
- 🌊 The season is short so e.g. move activities to the exam period (10 votes)

The structural barrier map developed within the Danish stakeholder conversation during Step 3 is shown in Figure 5.

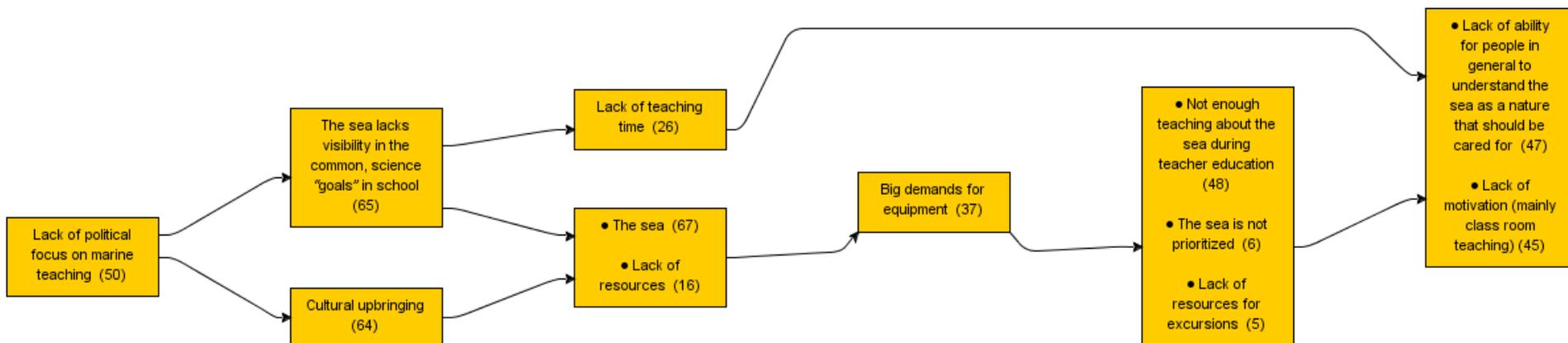


Figure 4 - Structural Barrier Map from Our Danish Ocean Conversations

The structural barrier map is the most tangible output from Our Danish Ocean Conversations. This structural barrier map is read from left to right with the barriers to the left significantly aggravating the barriers to the right.

For example, 'Lack of political focus on marine teaching' significantly aggravates 'The sea lacks visibility in the common, science "goals" in school'.

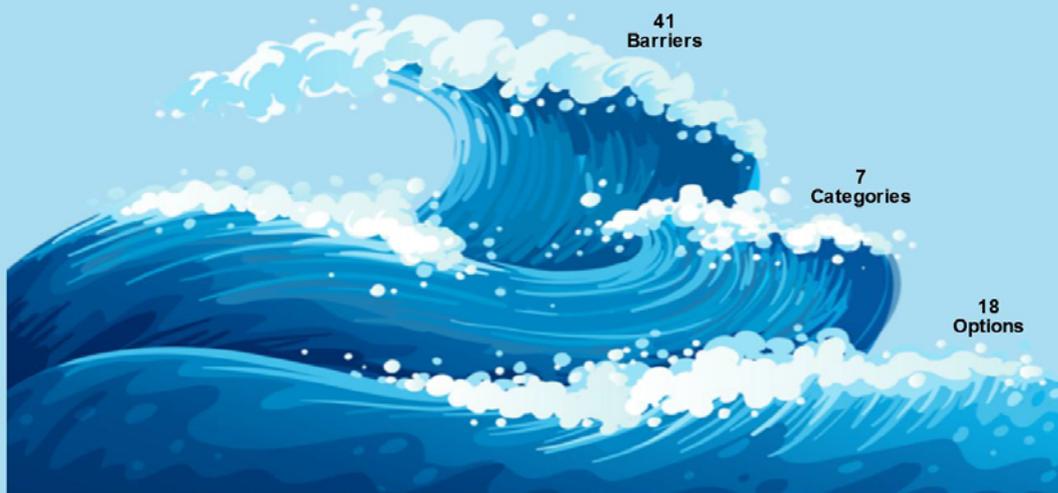
The three barriers grouped together in the same box, such as 'Not enough teaching about the sea during teacher education', 'The sea is not prioritized' and 'Lack of resources for excursions' are reciprocally inter-related and they significantly aggravate one another.

Three different barrier aggravation pathways are evident in Figure 5, with directional arrows indicating aggravating pathways.

The Results - Greece

Our Greek Ocean Conversation took place on the 19th of April at the Hellenic Centre for Marine Research (HCMR) in Greece. Thirteen stakeholders who were identified as experts in their respective fields represented sectors involved in teaching, education, outreach, curriculum, regulation and policy decisions in our conversation. One further stakeholder contributed to stage 1: online idea generation stage leading to a total number of fourteen stakeholders involved in Our Greek Ocean Conversations.

Our Greek Ocean Conversations resulted in the generation of:



The top six most voted for barriers to teaching 12-19 year olds about the oceans in Step 2 were:

- ⚓ The strict schedule of students both in and out of school does not allow them time for informal education activities (23 votes)
- ⚓ Demand for the application of new teaching methods for which time and resources are needed (12 votes)
- ⚓ Insufficient links of schools with scientific institutions that carry out marine research (12 votes)
- ⚓ Lack of consistency & continuity in the already offered marine science education of the educational system (11 votes)
- ⚓ Limited or no links between schools and research centres (9 votes)
- ⚓ Lack of linking marine science with potential jobs (9 votes)

The most voted for options in Step 4 were:

- 🌊 Promote the reshuffling of the official curriculum into a more flexible one, which will allow for a percentage of time to be allocated on new initiatives and will give teachers more freedom to select subjects for this time zone (17 votes)
- 🌊 Design and development of a thematic educational program with the cooperation of HCMR, Universities, Environmental Education Centres and the Environmental Education Department of the Ministry of Education (10 votes)
- 🌊 Evaluation of the already existing educational material with the aim of enriching it and/or creating new teaching methods in the framework of interactive educational teaching (10 votes)
- 🌊 Promote the investigation and use of resources to amplify government subsidies (9 votes)
- 🌊 Design vocational workshops to inform and educate youth on sea-related jobs (8 votes)

The structural barrier map developed within the Greek stakeholder conversation during Step 3 is shown in Figure 6.

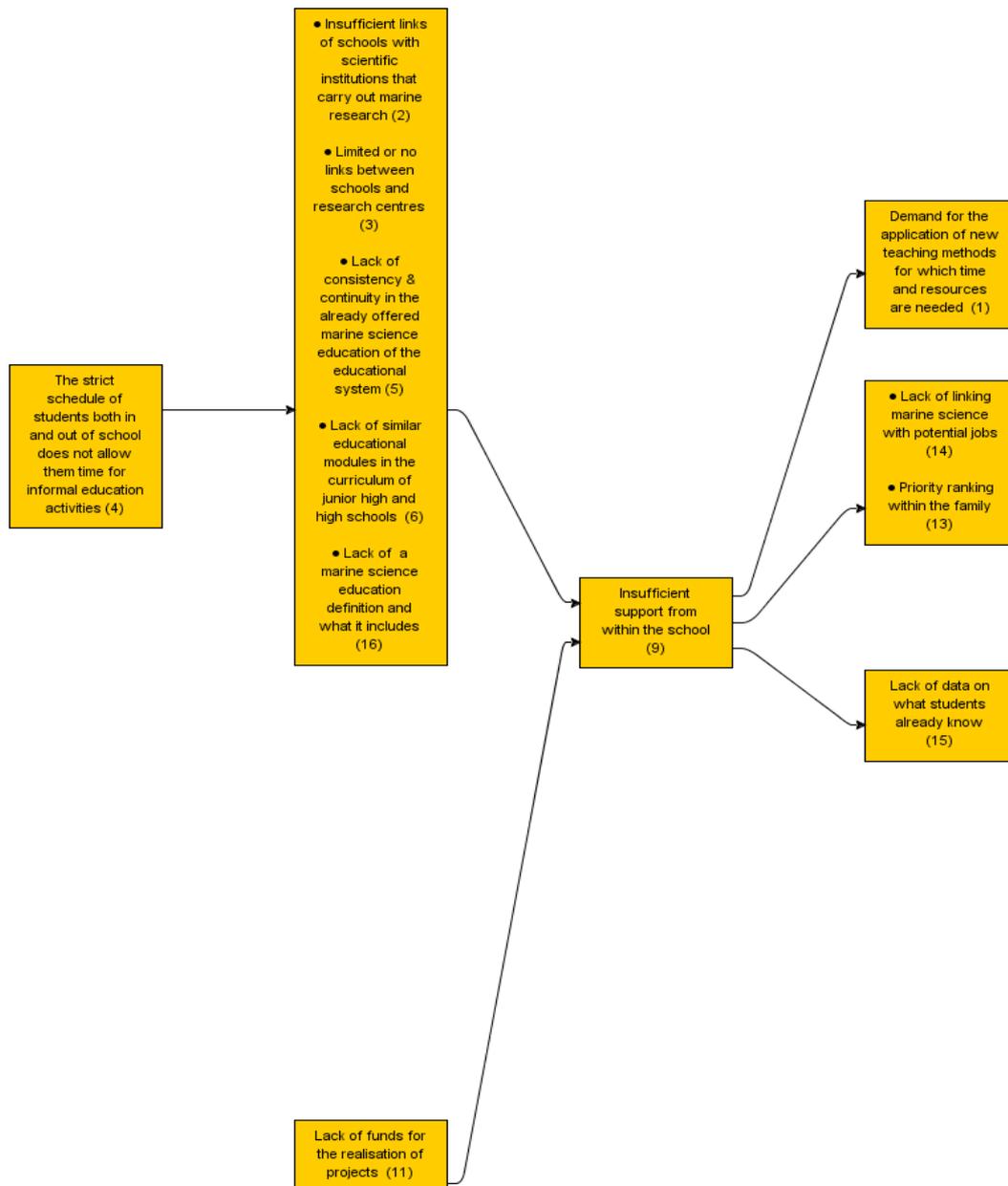


Figure 6 - Structural Barrier Map from Our Greek Ocean Conversations

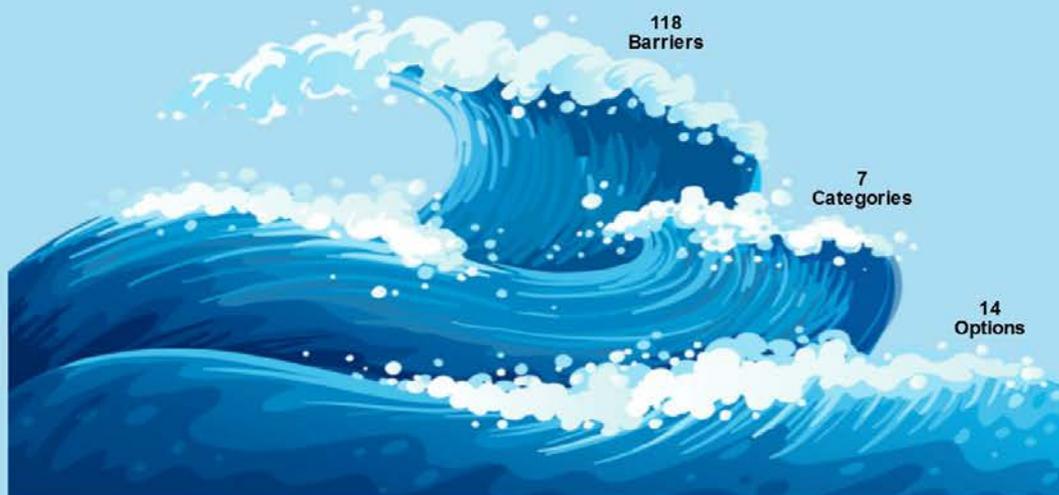
The structural barrier map is the most tangible output from Our Greek Ocean Conversations. This structural barrier map is read from left to right with the barriers to the left significantly aggravating the barriers to the right. For example, 'The strict schedule of students both in and out of school does not allow them time for informal education activities' significantly aggravates 'Insufficient links of schools with scientific institutions that carry out marine research'.

The five barriers grouped together in the same box, such as 'Insufficient links of schools with scientific institutions that carry out marine research', 'Limited or no links between schools and research centres', 'Lack of consistency & continuity in the already offered marine science education of the educational system', 'Lack of similar educational modules in the curriculum of junior high and high schools' and 'Lack of a marine science education definition and what it includes' are reciprocally inter-related and they significantly aggravate one another. Six different barrier aggravation pathways are evident in Figure 6, with directional arrows indicating aggravating pathways.

The Results - Portugal

Our Portuguese Ocean Conversation took place on Thursday, the 25th of May at Ciência Viva – Knowledge Pavilion in Portugal. Twelve stakeholders who were identified as experts in their respective fields represented sectors involved in teaching, education, outreach, curriculum, regulation and policy decisions in our conversation. Forty-one further stakeholders contributed to stage 1: online idea generation stage leading to a total number of fifty-three stakeholders involved in Our Portuguese Ocean Conversations.

Our Portuguese Ocean Conversations resulted in the generation of:



The top three most voted for barriers to teaching 12-19 year olds about the oceans in Step 2 were:

- ⚓ Lack of a national strategy plan to implement Ocean literacy (11 votes)
- ⚓ Inadequate education model (8 votes)
- ⚓ The school curriculum does not include the subject "oceans" (8 votes)

The most voted for options in Step 4 were:

- 🌊 Initial teacher graduation should include specific Ocean Literacy subjects and lifelong updating in research skills, ability to adapt and create new tools, contents and activities (18 votes)
- 🌊 Create space and time and flexibility or a new scholar schedule organization in order we can work the ocean topic in a multidisciplinary way (14 votes)
- 🌊 Empower teachers to manage curricula and to value Ocean Literacy issues/topics (even when not obvious) (14 votes)
- 🌊 The institutions must have mandatory time and budget assigned to outreach projects about the ocean (12 votes)
- 🌊 Organize a platform to share educational materials with a forum to discuss ideas about the educational materials (11 votes)

The structural barrier map developed within the Portuguese stakeholder conversation during Step 3 is shown in Figure 7.

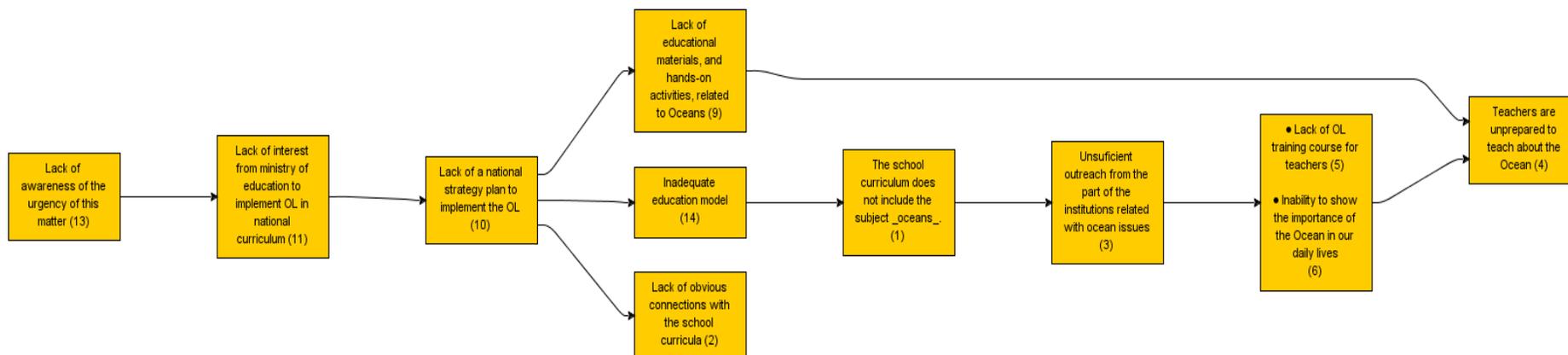


Figure 7 - Structural Barrier Map from Our Portuguese Ocean Conversations

The structural barrier map is the most tangible output from Our Portuguese Ocean Conversations. This structural barrier map is read from left to right with the barriers to the left significantly aggravating the barriers to the right.

For example, 'Lack of awareness of the urgency of this matter' significantly aggravates 'Lack of interest from ministry of education to implement OL in national curriculum'.

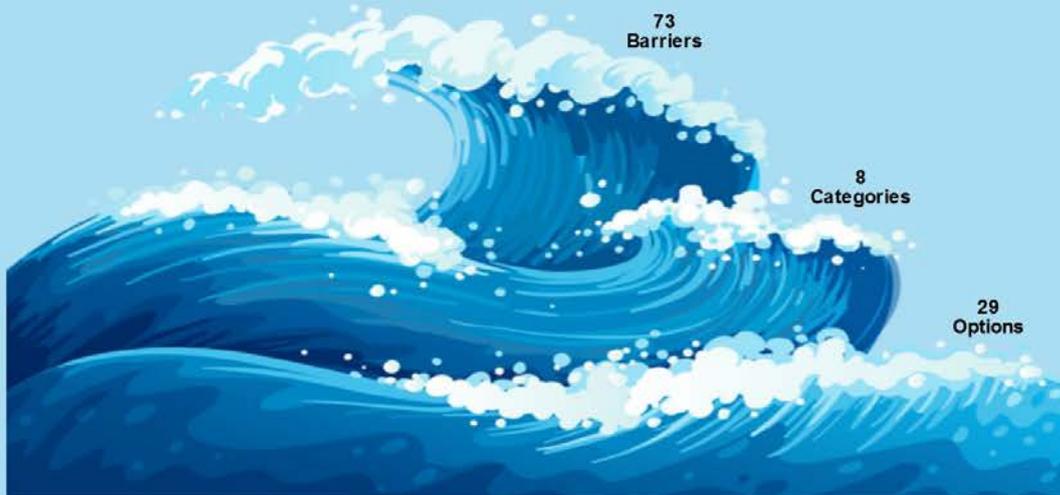
The two barriers grouped together in the same box, such as 'Lack of OL training course for teachers' and 'Inability to show the importance of the Ocean in our daily lives' are reciprocally inter-related and they significantly aggravate one another.

Three different barrier aggravation pathways are evident in Figure 7, with directional arrows indicating aggravating pathways.

The Results - Spain

Our Spanish Ocean Conversation took place on the 13th of April at the Museum of Science “Cosmocaixa”, in Barcelona in Spain. Fifteen stakeholders who were identified as experts in their respective fields represented sectors involved in teaching, education, outreach, curriculum, regulation and policy decisions in our conversation. Twenty-one further stakeholders contributed to stage 1: online idea generation stage leading to a total number of thirty-six stakeholders involved in Our Spanish Ocean Conversations.

Our Spanish Ocean Conversations resulted in the generation of:



The top five most voted for barriers to teaching 12-19 year olds about the oceans in Step 2 were:

- ⚓ Inability to convey the importance of the oceans for life on the planet, in an attractive way and adapted for young people (20 votes)
- ⚓ Lack of means to support knowledge and marine conservation environment, information, awareness and education on this subject (17 votes)
- ⚓ Lack of teacher training to transmit accurate knowledge in an attractive manner (16 votes)
- ⚓ Inability/difficulty to perceive the reality of the marine environment (14 votes)
- ⚓ Difficulty in establishing a link between our daily lives and the benefits that the ocean provides us or how our actions generate impacts on it (11 votes)

The most voted for options in Step 4 were:

- 🌊 Develop educational programs to be experiential and relevant for the students (24 votes)
- 🌊 A better regulation to move forward in the competence s and skills development, in order to overcome the actual dominant scheme of subjects and areas (20 votes)
- 🌊 Educate in complexity fostering a change on the methodology (19 votes)
- 🌊 Bank on environmental dissemination (related with the oceans) in prime-time, even if were just a brief spot (19 votes)

The structural barrier map developed within the Spanish stakeholder conversation during Step 3 is shown in Figure 8.

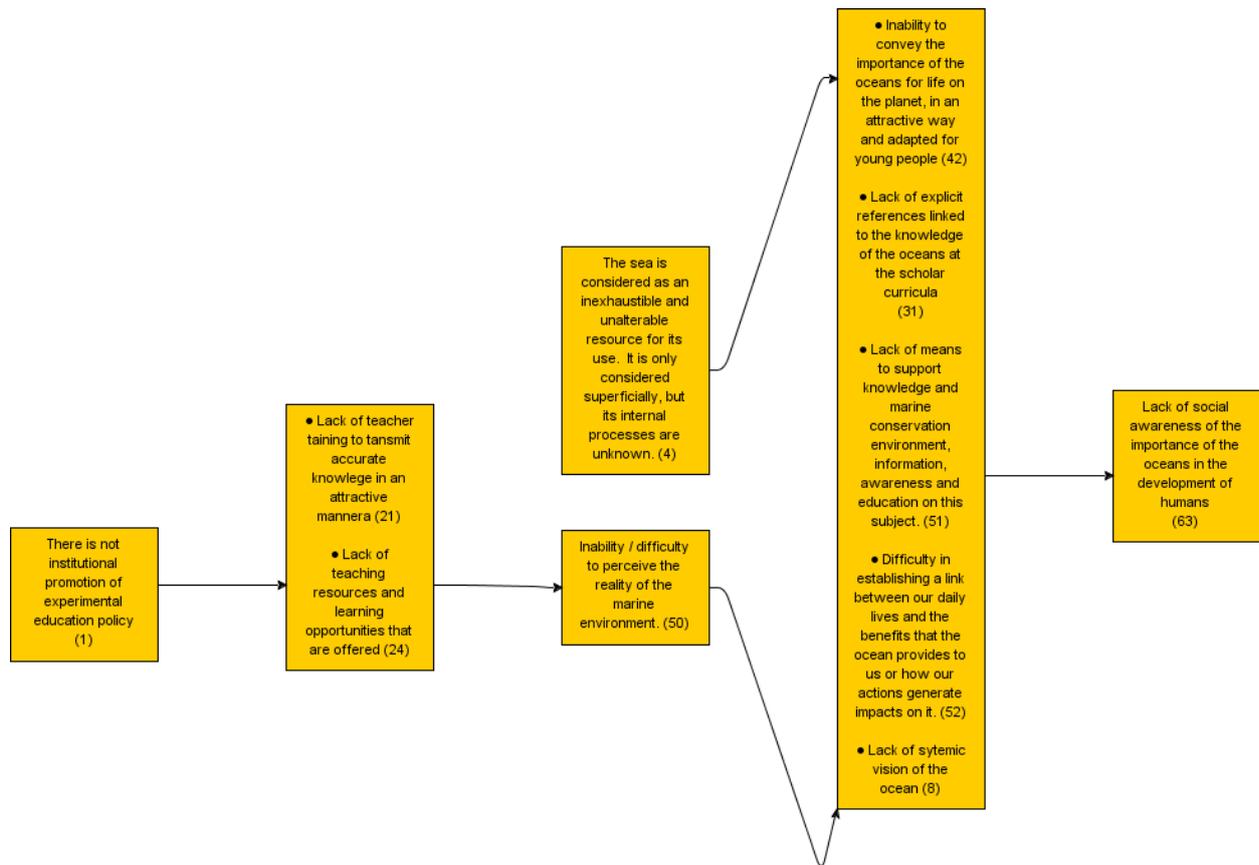


Figure 8 - Structural Barrier Map from Our Spanish Ocean Conversations

The structural barrier map is the most tangible output from Our Spanish Ocean Conversations. This structural barrier map is read from left to right with the barriers to the left significantly aggravating the barriers to the right.

For example, 'There is not institutional promotion of experimental education policy' significantly aggravates 'Lack of teacher training to transmit accurate knowledge in an attractive manner' and 'Lack of teacher resources and learning opportunities that are offered'.

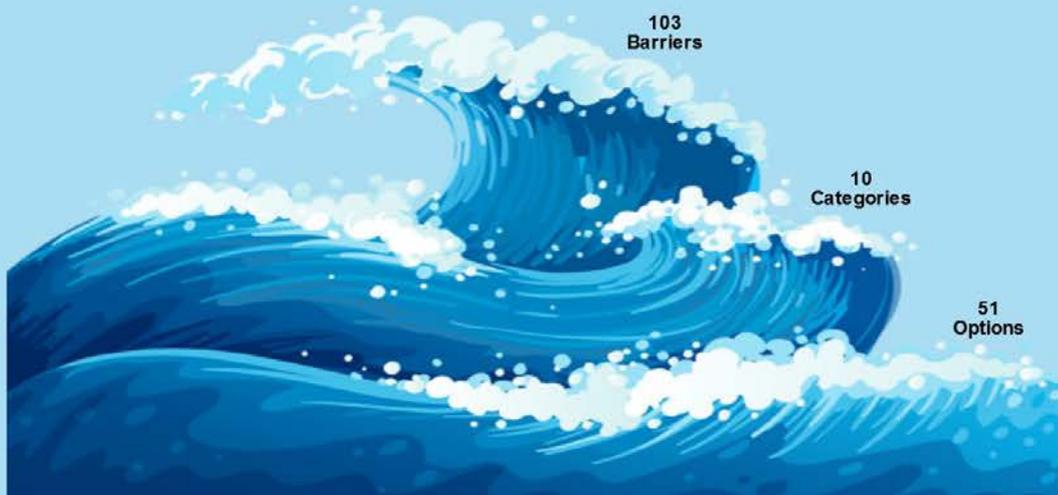
The five barriers grouped together in the same box, such as 'Inability to convey the importance of the oceans for life on the planet, in an attractive way and adapted for young people', 'Lack of explicit references linked to the knowledge of the oceans at the scholar curricula', 'Lack of means to support knowledge and marine conservation environment, information, awareness and education on this subject', 'Difficulty in establishing a link between our daily lives and the benefits that the ocean provides us or how our actions generate impacts on it' and 'Lack of systemic vision of the ocean' are reciprocally inter-related and they significantly aggravate one another.

Two different barrier aggravation pathways are evident in Figure 8, with directional arrows indicating aggravating pathways.

The Results - United Kingdom

Our United Kingdom (UK) Ocean Conversation took place on the 28th of April at the Centre for Environment, Fisheries and Aquaculture Science (Cefas) in Lowestoft in the UK. Eighteen stakeholders who were identified as experts in their respective fields represented sectors involved in teaching, education, outreach, curriculum, regulation and policy decisions in our conversation. Twenty-two further stakeholders contributed to stage 1: online idea generation stage leading to a total number of forty stakeholders involved in Our UK Ocean Conversations.

Our UK Ocean Conversations resulted in the generation of:



The top five most voted for barriers to teaching 12-19 year olds about the oceans in Step 2 were:

- ⚓ National Curriculum / Government support – top down approach (27 votes)
- ⚓ Lack of awareness in schools and wider society of the relevance and importance of our ocean (24 votes)
- ⚓ Stretched budgets within schools (22 votes)
- ⚓ A shortage of curricular time against competing monitored priorities is the single biggest obstacle in this sector (22 votes)
- ⚓ Lack of awareness of / expertise in Ocean Literacy (Education) amongst teaching profession (21 votes)

The most voted for options in Step 4 were:

- 🌊 Consider spreading marine topic across the curriculum (not just science) to allow more time for it to be communicated to students (21 votes)
- 🌊 Promote risks / benefits (15 votes)
- 🌊 Create an Ocean Steering Group to coordinate project ideas + develop feasible funded projects (15 votes)
- 🌊 Establish partnerships to jointly lobby government to change National Curriculum (13 votes)
- 🌊 Policies, Global Citizen Programme! 3 world days (1 per term, including the World Ocean Day), or off curriculum, or all (12 votes)

The structural barrier map developed within the UK stakeholder conversation during Step 3 is shown in Figure 9.

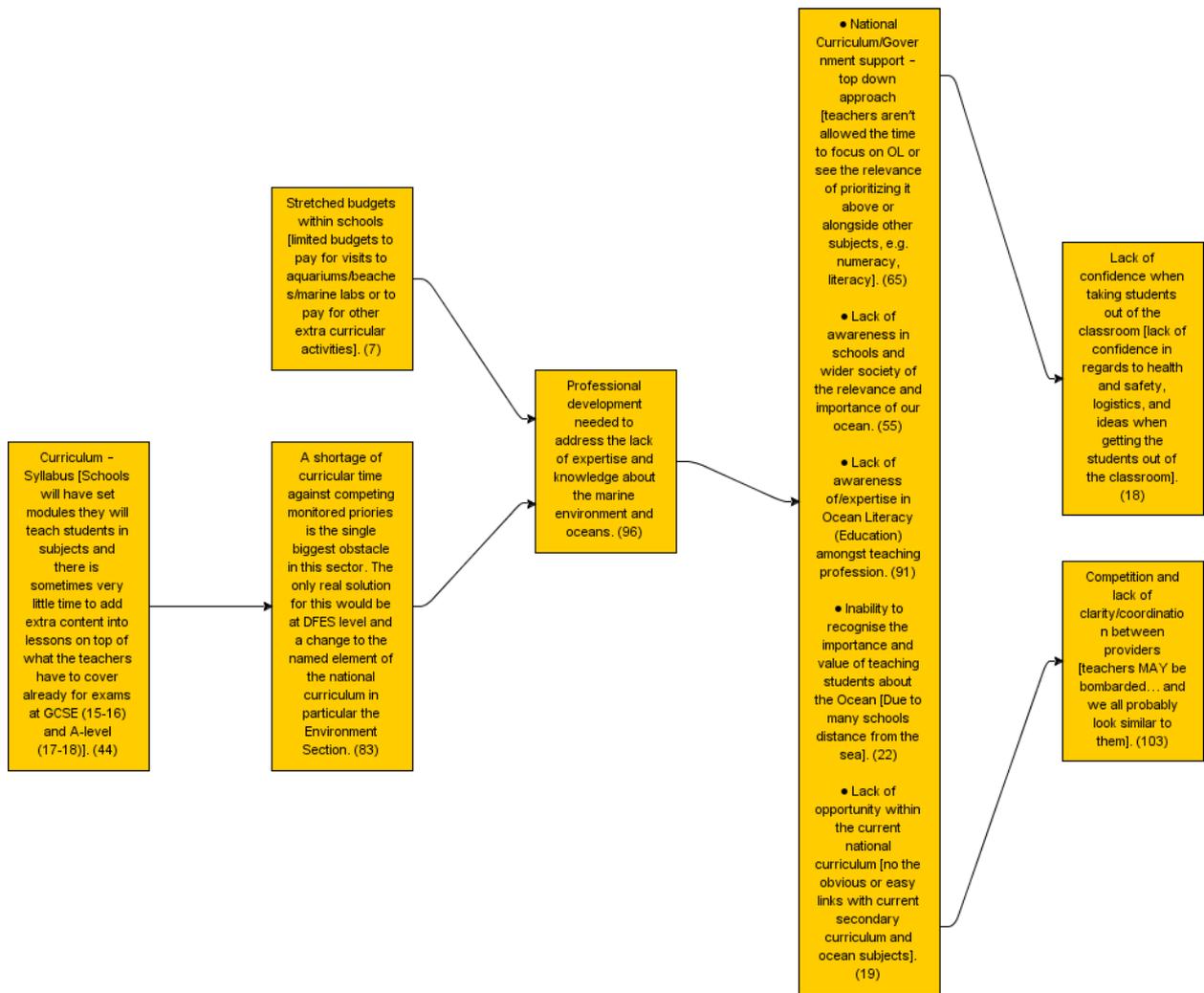


Figure 9 - Structural Barrier Map from Our UK Ocean Conversations

The structural barrier map is the most tangible output from Our UK Ocean Conversations. This structural barrier map is read from left to right with the barriers to the left significantly aggravating the barriers to the right.

For example, 'Curriculum – Syllabus ...' significantly aggravates 'A shortage of curricular time against competing monitored priorities is the single biggest obstacle in this sector. The only real solution for this would be at DFES level and a change to the named element of the national curriculum in particular the Environment Section'.

The five barriers grouped together in the same box, such as 'National Curriculum / Government support – top down approach ...', 'Lack of awareness in schools and wider society of the relevance and importance of our ocean ...', 'Lack of awareness of / expertise in Ocean Literacy (Education) amongst teaching profession ...', 'Inability to recognise the importance and value of teaching students about the Ocean ...' and 'Lack of opportunity within the current national curriculum ...' are reciprocally inter-related and they significantly aggravate one another.

Four different barrier aggravation pathways are evident in Figure 9, with directional arrows indicating aggravating pathways.

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