



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no [289042].



# **MARine Litter in Europe Seas: Social Awareness and CO-Responsibility**

## **DELIVERABLE 2.5 – EVALUATION OF SPECIFIC EDUCATIONAL AND OUTREACH ACTIVITIES RELATED TO MARINE LITTER**



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This report deliverable documents the development of four European-wide surveys to measure the impact of participation in specific outreach and educational activities on individuals' attitudes and behaviours regarding marine litter. It summarises the outreach and educational activities conducted in the project, outlines the survey development and implementation stages, and reports key findings.

**Approvals**

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## **1 EXECUTIVE SUMMARY**

This report deliverable documents the development of four European-wide surveys to measure the impact of participation in specific outreach and educational activities on individuals' attitudes and behaviours regarding marine litter. It summarises the outreach and educational activities conducted in the project, outlines the survey development and implementation stages, and reports key findings.



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## 2 INTRODUCTION

### 2.1 MARLISCO '*MARine Litter in European Seas: Social Awareness and CO-Responsibility*'

The MARLISCO project seeks to raise societal awareness of both the problems and the potential solutions relating to a key issue threatening marine habitats worldwide: the accumulation of marine litter. A major objective of the project is to understand and subsequently facilitate societal engagement in order to inspire changes in attitudes and behaviour. This project is a Mobilisation and Mutual Learning Action Plan with the aim of providing a series of mechanisms to engage key stakeholders with an interest in, or responsibility for, some aspect of reducing the quantity of litter entering the ocean. These include: industrial sectors; users of coastal and marine waters; the waste management and recycling sectors; Regional Sea Commissions and EU representatives; local municipalities; citizens' groups; environmental NGOs; school children and the general public; social and natural scientists.

MARLISCO recognises the need for a concerted approach to encourage co-responsibility through a joint dialogue between the many players. This is being achieved by organising activities across 15 European countries, including national debates in 12 of them, involving industry sectors, scientists and the public (WP4), a European video contest for school students (WP5), educational activities targeting the younger generation together with exhibitions to raise awareness among the wider public (WP6). MARLISCO is making use of innovative multimedia approaches to reach the widest possible audience, in the most effective manner (WP3). The project will develop and evaluate an approach that can be used to address the problems associated with marine litter and which can also be applied more widely to other challenges where there are substantial benefits to be achieved through better societal integration among researchers, stakeholders and society.

### 2.2 Objectives and scope of this report

The purpose of this report is '*To evaluate the effectiveness of specific outreach activities and educational materials to inform good practice for science-in-society interactions*'. It documents the development of four European-wide surveys (n = 2523) to measure the impact of participation in four outreach and educational activities on individuals' social perceptions and behaviours regarding marine litter and reports key findings. The four activities that we evaluate in this report are the MARLISCO National Fora (n = 268), Video Contest for School Children (n = 341), Public Exhibitions (n = 1842), and E-learning Course for Educators (n = 72).

This report provides a valuable step in understanding societal perceptions toward marine litter across Europe and in gauging the effectiveness of specific outreach and educational activities. Understanding societal perceptions and assessing the impact of outreach activities which seek to change individuals' attitudes and behaviours is critical in order to better engage society in the problem and solutions surrounding marine litter. It is hoped that this report will inform academic and applied audiences across the marine, environmental and social sciences interested in evaluating the effectiveness of a variety of outreach and engagement activities concerning environmental issues.

### 2.3 Outreach and educational activities evaluated

The four outreach and educational activities that were implemented and evaluated across Europe in the MARLISCO project are described below. For more information regarding each activity visit the project website [www.marlisco.eu](http://www.marlisco.eu) or contact the activity leaders. The report then outlines the method and key findings from each evaluation to assess the effectiveness of each outreach activity.





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### **2.3.1 National Fora (WP4)**

The WP4 National Fora task was led by University College Cork (UCC), Ireland, who designed the structure and format of the Fora. The Fora took place in 12 countries across the MARLISCO consortium, facilitated and organised by national partners (Italy, Netherlands, UK, France, Slovenia, Ireland, Romania, Germany, Cyprus, Bulgaria, Portugal and Turkey). The Fora were designed to engage a number of stakeholders with an interest in, or responsibility for, reducing marine litter, and discussions covered the characteristics, sources, impacts and solutions to the problem. The main objectives were (1) To provide a forum for discussing the marine litter issue in a readily accessible format so that different stakeholders can appreciate both the scale of the marine litter issue and the difficulties in providing long-term solutions given varying levels of public perception of the problem and the technical, economic and waste management policy constraints on industry, and (2) To afford the opportunity for stakeholders to become more informed on the issues associated with marine litter and its impacts at the national and regional sea level, and to provide an opportunity for them to participate in the surrounding debate and actively contribute to providing viable solutions to this serious societal problem. For more information about the Fora go to <http://www.marlisco.eu/fora.en.html>

### **2.3.2 Video Contest for School Children (WP5)**

The WP5 European Video Contest was led by the EUCC Coastal and Marine Union, Netherlands, who developed a common framework for the contest (structure, rules and guidance). The Video Contest took place in 14 countries across the consortium, facilitated and organised by national partners (Italy, Netherlands, UK, France, Slovenia, Ireland, Romania, Germany, Cyprus, Bulgaria, Spain, Portugal, Turkey and Denmark). The Video Contest sought to engage youngsters in the topic of marine litter and encourage them to think about the sources, impacts and solutions to marine litter. The main objective was to run a competition targeting schools or youth associations in which participants prepare a short video on the issue of marine litter considering one of a few themes, e.g. why is marine litter a concern; what can be done; what has been done in our school/local community to deal with it. For more information about the Video Contest go to <http://www.marlisco.eu/video-contest.en.html>

### **2.3.3 Public Exhibitions (WP6)**

The WP6 National Exhibition concept and content was designed by the Mediterranean Information Office for Environment, Culture and Sustainable Development (MIO-ECSDE) and implemented in 14 countries across the consortium, facilitated and organised by national partners (Italy, Netherlands, UK, France, Slovenia, Ireland, Romania, Germany, Cyprus, Bulgaria, Portugal, Greece, Turkey and Denmark). The National Exhibitions were designed to inform and inspire action in the general public in an accessible and engaging medium with scientific information and collaboration with national artists. A series of posters and interactive exhibits documented the composition, sources, and impacts of marine litter and possible solutions to tackle the problem and were exhibited in a range of locations, including museums, aquariums, galleries, and outdoor areas. For more information about the Public Exhibitions go to <http://www.marlisco.eu/exhibition.en.html>

### **2.3.4 E-learning Course for Educators (WP6)**

The WP6 educational pack 'Know, Feel, Act! To Stop Marine Litter: Lesson Plans and activities for middle school learners' and E-learning course was developed by MIO-ECSDE with input from many partners and promoted across the consortium by national partners. The educational pack and E-learning course were developed to inform, sensitise and enable European teachers and students to take action to tackle the issue of litter in our seas and coasts. The material contains 17 learning activities examining the characteristics, sources, effects and possible ways to tackle the problem, addressing it from an environmental, societal, cultural and economic point of



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view. Each activity consists of a specific learning task or game (4 pages) and a worksheet for students (1 page). The activities are self-standing and can be applied separately or combined in clusters according to educator needs. It was designed to primarily serve young people aged 10-15 years in formal or non-formal educational settings. The E-learning course aimed to introduce the educational pack to formal and non-formal European educators and train them in how to use the material in their teaching. The material was prepared in English language, and by the end of the MARLISCO project will be available in many European languages. For more information about the Educational pack and the E-learning Course go to <http://www.marlisco.eu/education.en.html>

#### **2.4 Ethical procedures.**

Ethical approval was obtained from Plymouth University's Faculty of Science and Technology Ethics Board. Consent and debrief forms were produced in line with Plymouth University ethical procedures for conducting surveys with human participants. Specifically, respondents were informed that participation was voluntary and that their information was confidential.



### 3 EVALUATION OF THE NATIONAL FORA

#### 3.1 Introduction and aims

The aim of the National Fora was to provide platforms for structured dialogue between the key stakeholders, relevant experts and the general public on the topic of marine litter and focused on developing solutions together. Participating stakeholders included representatives from coastal and marine industry, Government and policy, plastic and packaging industry, waste management, academia, NGOs, and retail. The Fora sought to provide participants with the necessary scientific information in a readily accessible format and not only provide an opportunity for participants to actively engage in discussion but offering a platform for participants to submit viable solutions that may contribute to reducing marine litter.

The evaluation implemented alongside the Fora sought to assess:

- Participants' attitudes about marine litter (concern, sense of personal responsibility, motivation, efficacy, and perceptions about solutions and about other sectors) and how these changed after participating in the Fora
- Participants' intentions to engage in solutions to reduce marine litter and how these changed after participating in the Fora
- Whether there is a relationship between participants' pre-Fora attitudes, post-Fora attitudes, and intentions

#### 3.2 Method/implementation

##### 3.2.1 *The National Fora*

A common format for the 12 National Fora implemented across Europe was developed by University College Cork (UCC), Ireland (see Kopke & Doyle, 2014). The standard format comprised a live audience of individuals from different stakeholder groups (organised into tables of approximately 5 people per table), a panel of 4-5 experts, and a facilitator who led the event. Some countries also had a satellite audience composed of participants that watched and participated online via webcasting technology at a chosen venue.

To allow accessible transfer of the latest scientific knowledge, the MARLISCO fora included interactive activities for participants (e.g. table quiz and hands-on activity). These activities were used to get key messages across to participants but also to generate and promote dialogue between all participants. Each team was asked to work together to come up with actions that may help to address the problem of marine litter. Using this approach the stakeholders bring their unique experience to the table and then work together through knowledge exchange and consensus building, in order to develop actions that are agreeable to all.

The MARLISCO fora format was flexible in order to take advantage of unique national characteristics and able to be modified between events to incorporate improvements in the future. The National Fora took place between April 2014 and April 2015. For more information about the Fora go to <http://www.marlisco.eu/fora.en.html> and look out for the forthcoming Deliverable 4.2 – (videos from national Fora), and Deliverable 4.3 (outcomes for each national event: Kopke, Bennisson, Maes, Vlachogianni, Metcalfe, & Gheorge, 2015).

##### 3.2.2 *Evaluation survey*

A short survey was developed in consultation with UCC to evaluate the National Fora and changes in participants' perceptions and behaviours regarding the issue. The survey formed a quantitative evaluation that participants completed pre- and post- participating in the Fora. The survey underwent initial piloting and analysis in the UK to ensure question items and response



formats were clear, and to determine duration. Only minor edits were made and the survey took approximately 5-10 minutes to complete.

The survey included a set of questions designed to assess participants' attitudes about marine litter in terms of their concern, sense of personal responsibility, motivation, efficacy, and perceptions about solutions and about other sectors (e.g., "I think marine litter is a very important problem"; "I feel responsible for marine litter"; "I do not feel motivated to take actions that will reduce marine litter"; "I feel able to take actions that will reduce marine litter"; "Most solutions to reduce marine litter are not very feasible"; "I think that the different sectors are working together effectively to tackle marine litter"). Specifically, participants were asked to indicate whether they agreed or disagreed with these statements on a scale from 1 (strongly disagree) to 7 (strongly agree).

Participants were then asked a set of questions to assess their intentions to engage in solutions to reduce marine litter (e.g., "Support recycling schemes"; "Help reduce plastic bag use in supermarkets"; "Support schemes that aim at reducing packaging"). Participants were asked to indicate whether they agreed or disagreed with these statements, again on a scale from 1 (strongly disagree) to 7 (strongly agree).

Participants also provided demographic information, including age, gender, and country of residence. The post-Fora survey was identical to the pre-Fora survey but had an additional final question where participants indicated whether they agreed or disagreed (on the same 7-point scale) with three statements: "I felt my views were heard during the Forum"; "I wasn't given enough opportunity to contribute during the Forum"; "I felt my views were valued during the Forum" (see figures in Results).

The survey was translated for all participating countries by MARLISCO partners. Translations were cross-checked with additional native speakers for accuracy and to ensure the meaning of questions had not been significantly altered in the process. Guidance notes were produced to ensure consistency in implementation of the survey across Europe. MARLISCO partners were responsible for implementing the pre-post survey in their country. The majority of live audience participants completed the pre-Forum survey online before attending and the post-forum survey on paper at the end of the event or shortly after, and satellite participants completed the pre- and post-Forum survey online. If participants arrived at the Forum without having completed the pre-Forum survey online, they were asked to complete it on paper on the day. An online response tracking tool was developed to record the number of surveys completed online (broken down by country of residence).

### 3.3 Results

The results presented below are based on data from those attending the National Fora and who participated in the pre- and post-contest survey (note: some individuals participated in the Fora but did not complete the pre- and/or post-Fora survey, so we were unable to obtain matched responses). Where we report differences, these are based on statistically significant results from Analyses of Variance (ANOVA) and (matched) paired *t*-tests.

#### 3.3.1 Summary of respondents

A total of 268 participants (160 females, 108 males) attended the National Fora and completed pre-post surveys across Europe. A breakdown of the sample by country of residence and age is shown in Table 2.1 and Figure 2.1. Participants ranged in age from 13-69 years (Mean age = 40).



Table 2.1: Number of respondents by country of residence

Country of residence	N
ITALY	53
PORTUGAL	53
CYPRUS	33
UK	24
FRANCE	23
SLOVENIA	21
IRELAND	15
NETHERLANDS	13
GERMANY	11
TURKEY	10
ROMANIA	9
BULGARIA	3
TOTAL	268

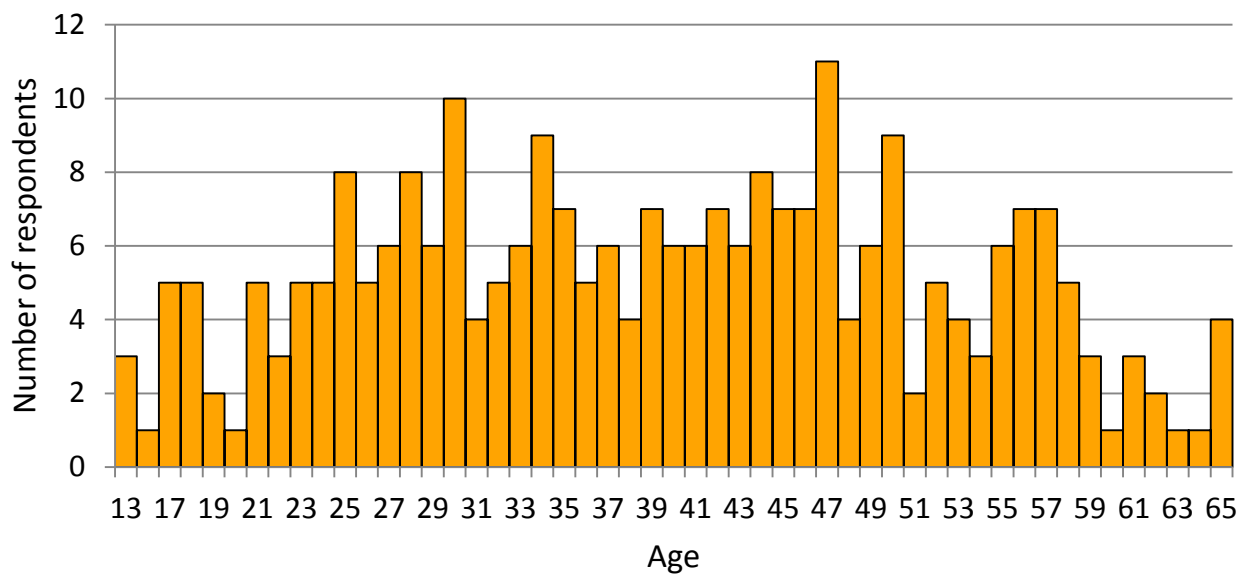


Figure 2.1. Age of participants in the sample (those who attended the Fora and completed the pre-and post-survey)

### 3.3.2 Attitudes pre- and post- Fora

Participants judged marine litter to be a very important problem that they were very worried about before participating in the Fora, and this did not significantly change after taking part in the Fora (Figure 2.2). Participants also disagreed that marine litter is too large a problem to tackle, that it is a future threat rather than a present one, and that enough is being done to tackle the problem, which highlights an acceptance that there is a need for action - and now (Figure 2.2). After attending the Fora, there was greater agreement that marine litter is a present threat not just a future one (i.e., participants disagreed to a greater extent that marine litter is a future threat rather than a present one).



Participants' pre-Fora responses indicate that, on average, they did not feel particularly responsible for marine litter (around the mid-point of the scale), but they did feel able to take actions that would reduce marine litter, and that their actions would make a difference (Figure 2.3). After participating in the Fora, individuals felt significantly more responsible, more able to help, and that their actions would be more effective compared to before the Fora. Participants also felt highly motivated to reduce marine litter, and this did not change after the Fora.

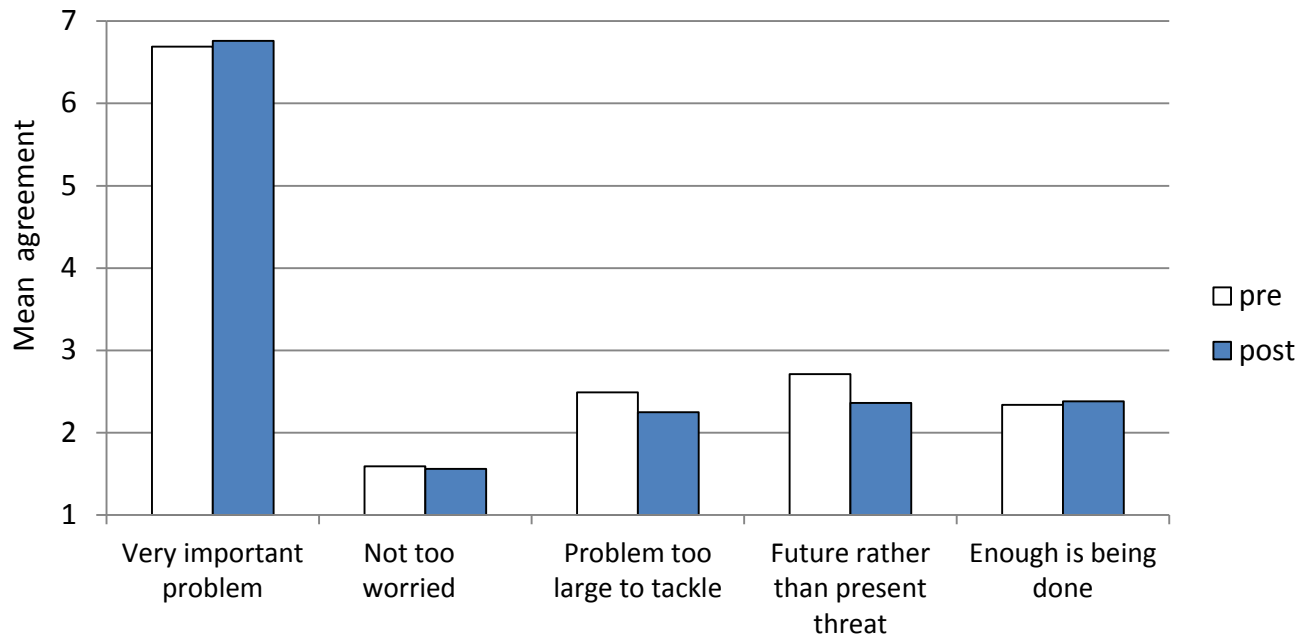


Figure 2.2. Problem awareness and concern about the issue of marine litter and need for action pre- and post-Fora (1-7 scale: strongly disagree – strongly agree)

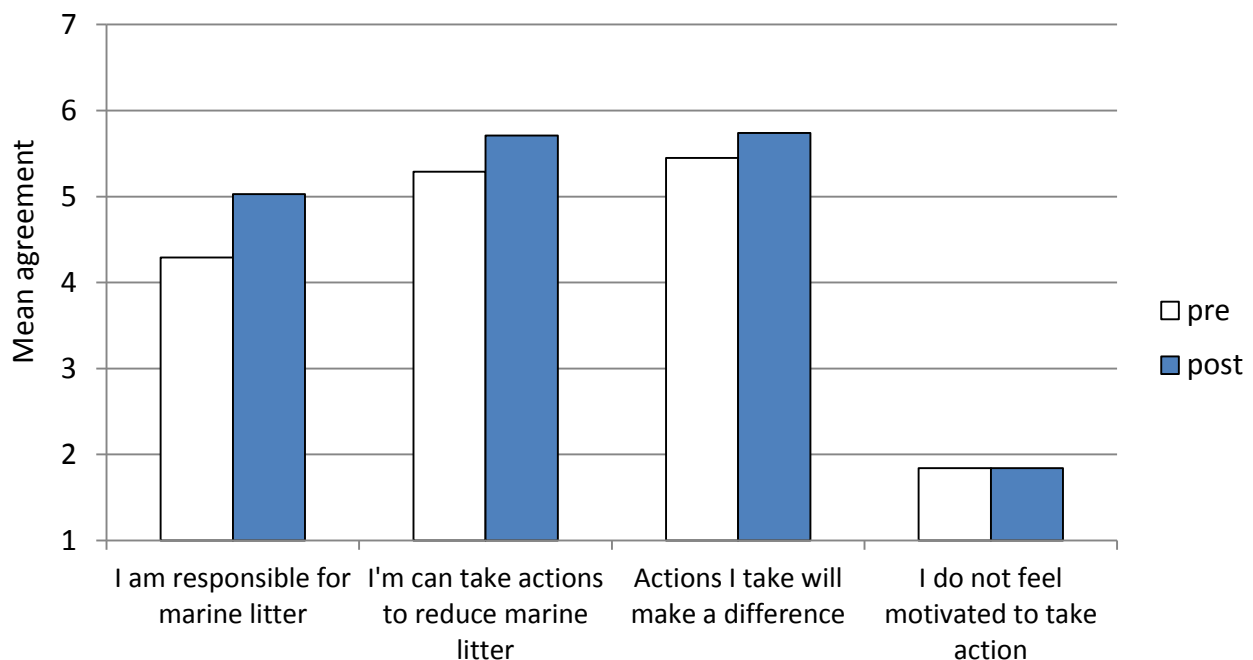


Figure 2.3. Personal responsibility, competence/efficacy, response efficacy and motivation pre- and post-Fora (1-7 scale: strongly disagree – strongly agree)



Results also indicate that Forum participants believed that current solutions to reduce marine litter are not very effective, but they disagreed slightly that it is difficult to create solutions that are both feasible and effective, although this was around the mid-point of the scale (Figure 2.4). These perceptions remained the same after participating in the Fora. In addition, before the Fora, participants disagreed slightly that most solutions proposed to reduce marine litter are not very feasible. After the Fora, participants showed significantly greater disagreement that most solutions are not very feasible (i.e., there was greater agreement that solutions were feasible). Before the Fora, participants also disagreed that it is easy to implement solutions to marine litter. After the Fora, participants still disagreed that it is easy to implement solutions, but this perception had significantly decreased (i.e., individuals felt it was easier to implement solutions after they had participated in the Fora).

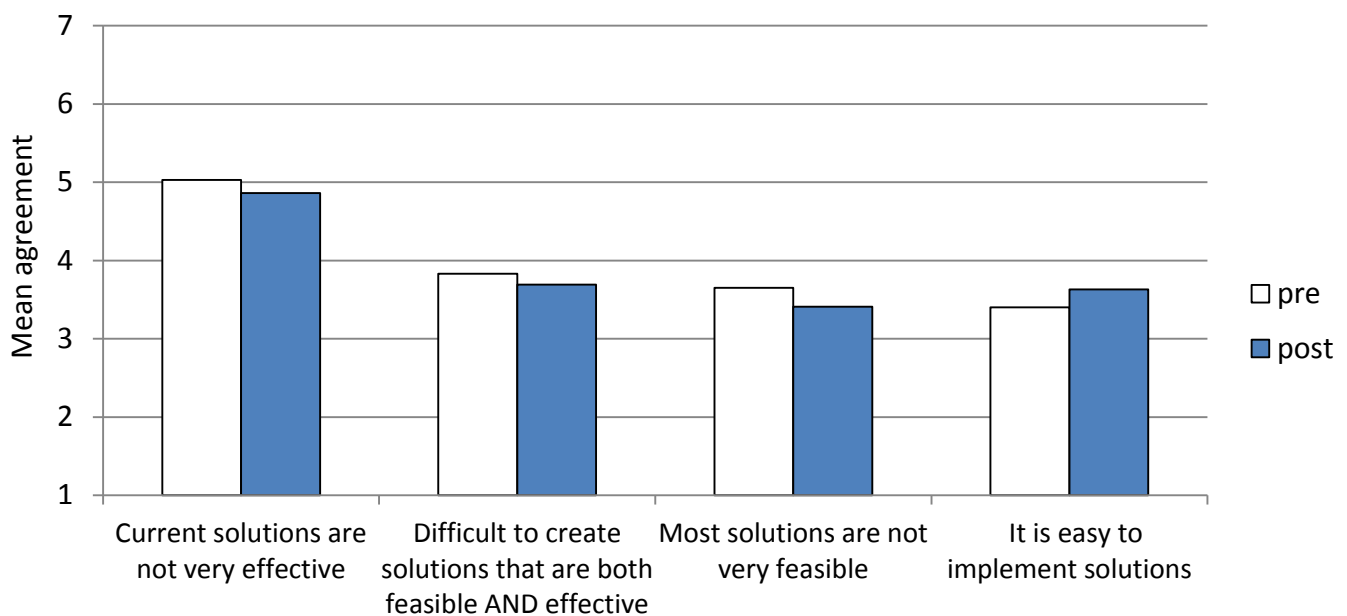


Figure 2.4. Perceptions about the effectiveness and feasibility of solutions to marine litter pre- and post-Fora (1-7 scale: strongly disagree – strongly agree)

Whilst participants strongly believed that the different sectors need to work together to tackle the problem of marine litter, they did not perceive the sectors to be working effectively together or accepting sufficient responsibility for the problem (Figure 2.5). There were no significant differences between pre- and post-Fora responses to these questions – participants’ perceptions remained the same. In addition, before the Fora participants perceived most people as lacking motivation to reduce marine litter. After attending the Fora, participants still believed that most people were unmotivated, but this perception had significantly decreased.

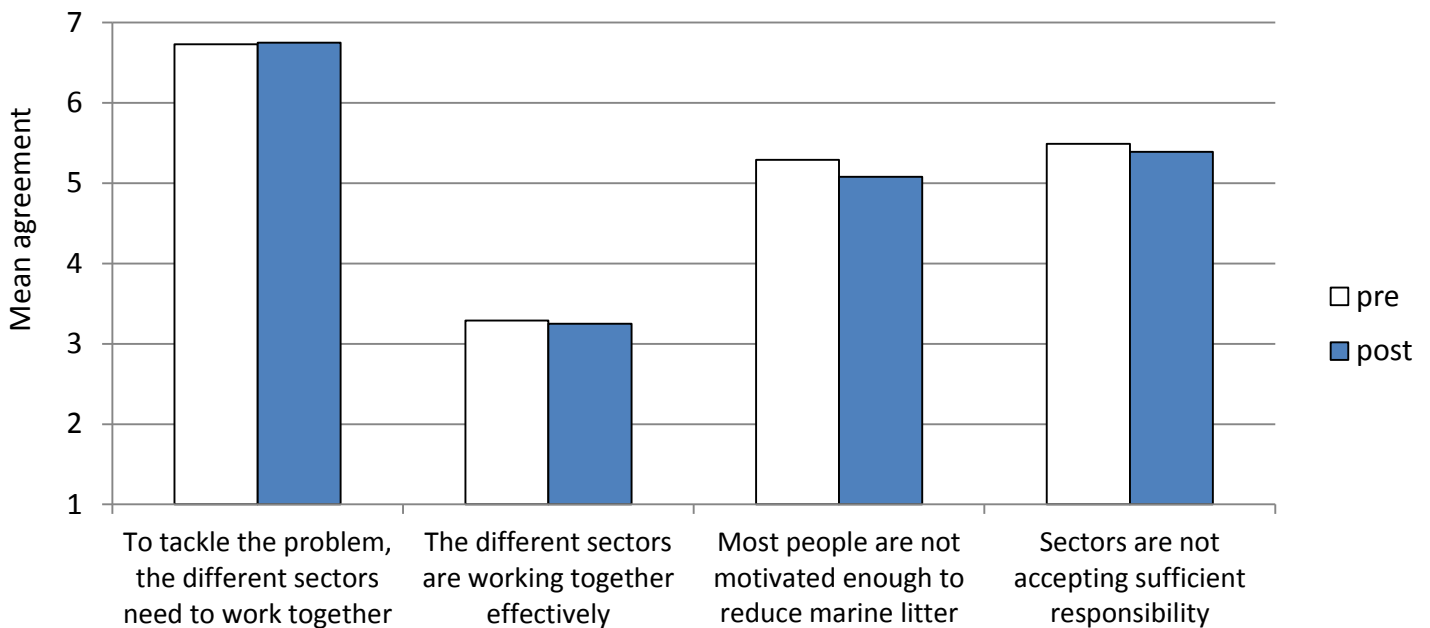


Figure 2.5. Perceptions about other sectors and working together effectively pre- and post-Fora (1-7 scale: strongly disagree – strongly agree)

### 3.3.3 Intentions to engage in solutions to reduce marine litter pre- and post-Fora

Seven questions assessed participants’ personal intentions to engage in solutions. Participants, on average, did not have strong intentions to write to political representatives about marine litter, and this increased only slightly after participating in the Fora (Figure 2.6). Participants had greater intentions to engage in all other solutions to reduce marine litter, and participants’ intentions increased significantly after taking part in the Fora (except supporting Government and policy legislation on marine litter which remained the same pre-post Forum)

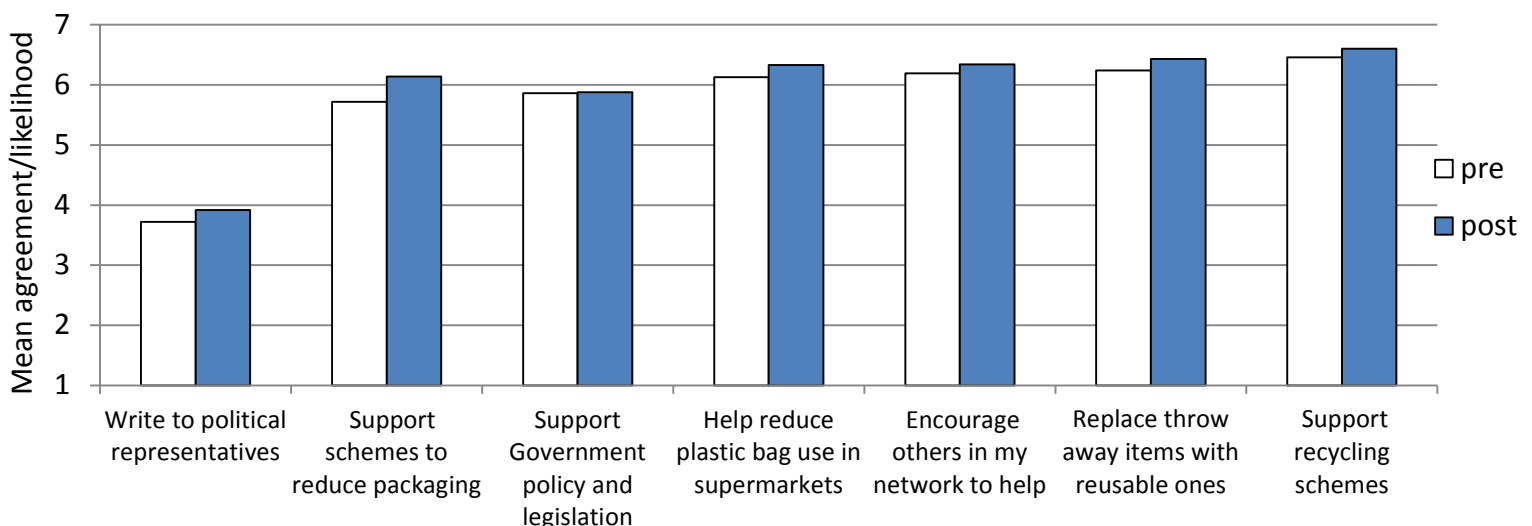


Figure 2.6. Intentions to engage in solutions to reduce marine litter pre- and post-Fora (1-7 scale: no, definitely not - yes, definitely)





### 3.3.4 Feeling included and valued during the Fora

Three questions assessed whether participants felt included and valued during the Forum. As Figures 2.7a-c show, the majority of participants felt their views were heard and valued, and that they were given sufficient opportunity to contribute to the Fora.

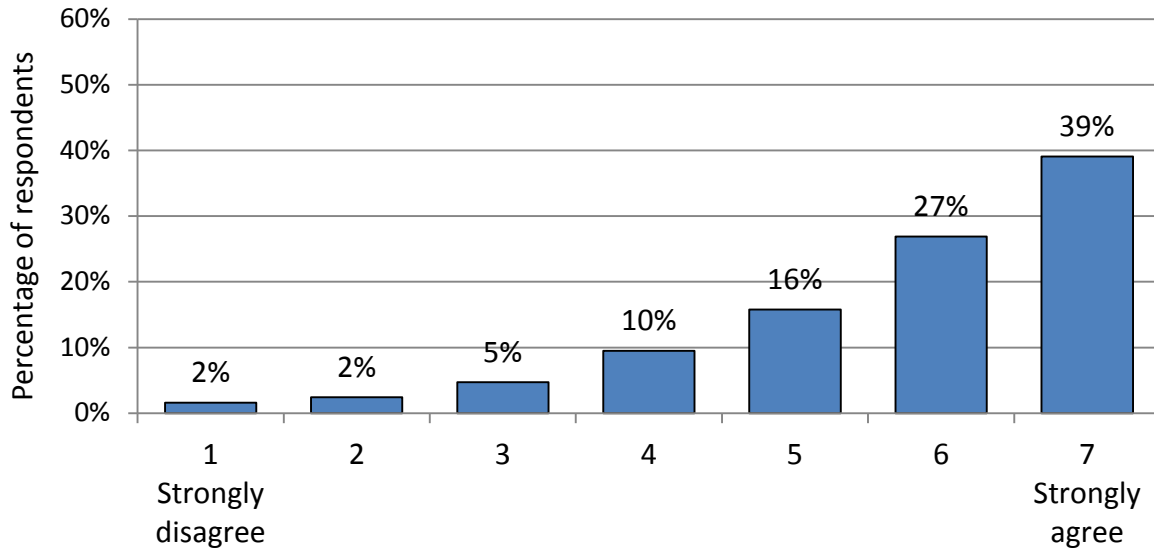


Figure 2.7a. The extent to which participants agreed that "I felt my views were heard during the Forum" (1-7 scale: strongly disagree – strongly agree)

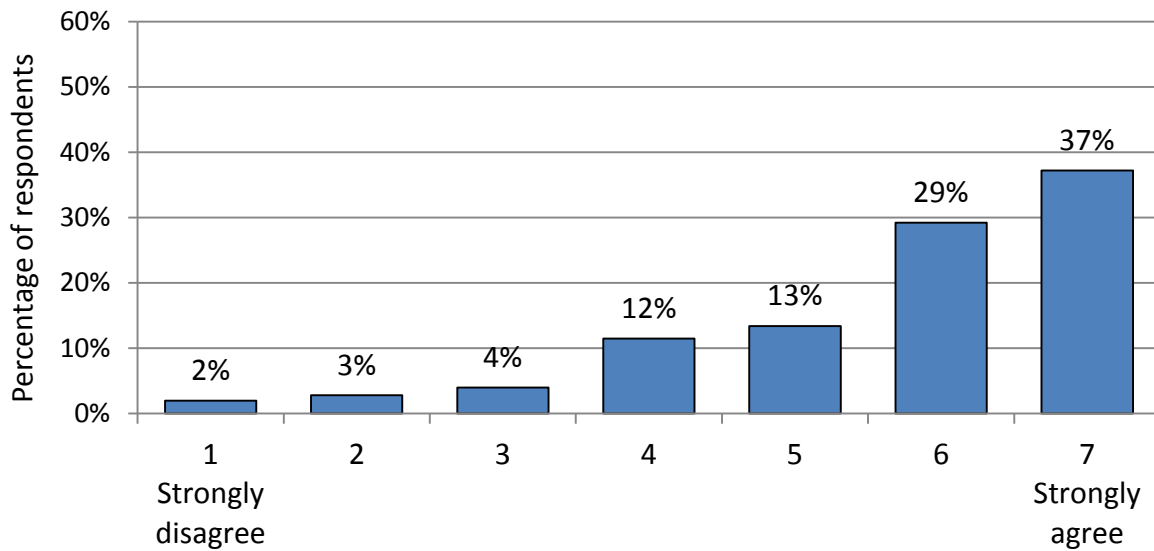


Figure 2.7b. The extent to which participants agreed that "I felt my views were valued during the Forum" (1-7 scale: strongly disagree – strongly agree)

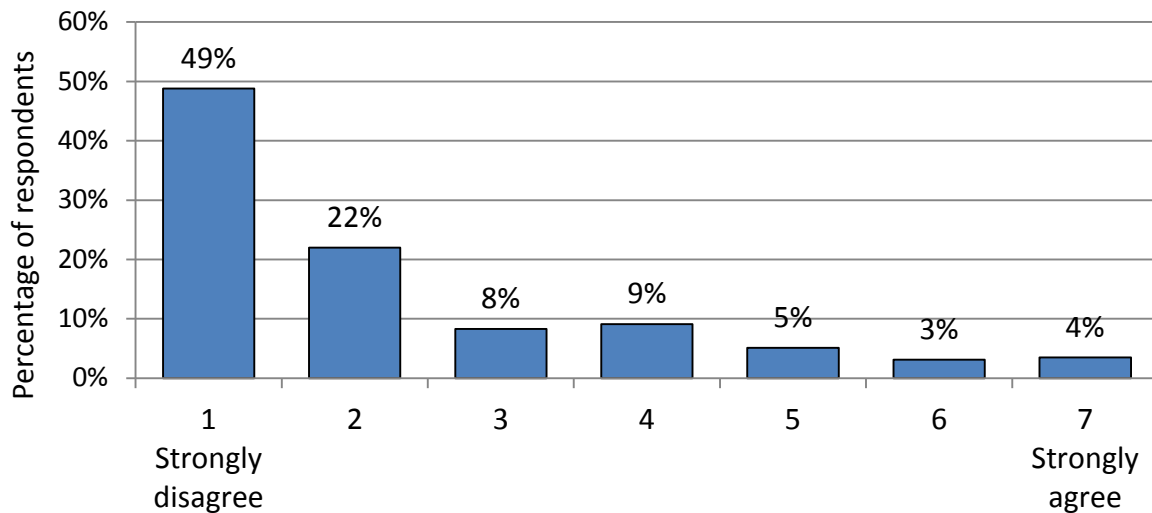


Figure 2.7c. The extent to which participants agreed that “I **wasn’t** given enough opportunity to contribute during the Forum” (1-7 scale: strongly disagree – strongly agree). Note, this is a negatively phrased item, so disagreement with the statement is favourable (i.e., participants agree that they were given enough opportunity to contribute)

### 3.4 Discussion

The National Fora were designed to provide a platform for structured dialogue between the key stakeholders, relevant experts and the general public on the topic of marine litter and focused on developing solutions together. The evaluation survey provided an insight into stakeholder perceptions and intentions to support solutions to reduce marine litter before and after participation in these interactive and dynamic events across Europe. Participants attending the Fora arrived with good understanding and interest in the issue of marine litter, and perceived it to be a highly important problem to be concerned about, and which needed tackling. Overall, the results indicate that after participating in the Fora, individuals felt significantly more responsible, more able to help, and that their actions would be more effective compared to before the Fora. Participants’ intentions to engage in several solutions to reduce marine litter also increased significantly after participating in the Fora.

The Fora enabled stakeholders from coastal and marine industry, Government and policy, plastic and packaging industry, waste management, academia, NGOs, and retail to interact to discuss the issue of marine litter and potential solutions together in open dialogue. The National Fora are a good example of an activity that can engage multiple sectors and increase sense of personal responsibility, efficacy and support for solutions. However, it is important to understand that individuals from different sectors may come to events such as these with attitudes that can be harder to change, such as the perception that despite needing to work together to tackle the problem, the different sectors are not working together effectively or taking sufficient responsibility for the problem. Whilst this did not appear to impede their personal intentions to engage in solutions, such perceptions may form barriers to finding effective solutions that require joint support.

It is also important to keep in mind that, whilst they followed a similar structure and format, each country holding a Forum had flexibility in the speakers invited, duration, and activities. Due to the dynamic nature of the Fora, discussions will have varied and this may play an important role in influencing participants’ attitudes and intentions. A challenging, yet interesting next step would involve a more qualitative analysis of the video recordings from each Forum to explore any differences and similarities and how this may affect perceptions and engagement of different stakeholders.



## 4 EVALUATION OF THE VIDEO CONTEST FOR SCHOOL CHILDREN

### 4.1 Introduction and aims

The aim of the Video Contest was to engage children across Europe in the issue of marine litter and motivate them to learn about the causes, negative impacts and solutions to the problem, and how they can get involved and help reduce marine litter. More specifically, the Video Contest encouraged children from across Europe to enter a competition with youngsters from their country and produce a short video about marine litter. It aimed at fostering a sense of citizenship and ownership in the younger generation and giving them an active voice in such a societal problem. The videos also have the potential to serve as messages that can be used to inform and trigger awareness in a wider audience. Through participating in the Video Contest we sought to increase children's awareness of the problem, their concern about it, their understanding of the various causes and negative impacts, and their practical actions to reduce marine litter.

The evaluation implemented alongside the Video Contest sought to assess:

- Children's concern about marine litter and their understanding of the problem (impacts, causes, % plastic, degradation time, and self-reported actions)
- How children's concern, understanding and self-reported actions changed after participating in the Video Contest
- Whether demographic factors (age and gender) are associated with children's concern, understanding and actions.

### 4.2 Method/implementation

#### 4.2.1 The Video Contest

A common framework to regulate the competition was developed by EUCC Coastal and Marine Union, Netherlands (see Veiga, 2013 – Deliverable 5.1 <http://www.marlisco.eu/video-contest-51.en.html>). The MARLISCO partners responsible for implementing the contest in their countries had flexibility in defining the most appropriate age-range to target at the national level, based on the suitability of the video contest and the theme to the school curricula and activities. The Video Contest was launched in September 2013 and targeted formal and informal groups of students in 14 of the countries covered by the MARLISCO project.

Participating teams were asked to prepare a 2 minute video on the issue of marine litter considering one of a few themes, e.g. why is marine litter a concern?; what can be done?; what has been done in our school/local community to deal with it? During the contest, school teams could also receive professional technical support on video production, mainly as workshops attended by students and supervising teachers during different phases of the video elaboration. This helped address potential logistic and technical capacity gaps in these institutions and to provide an added-value and incentive for schools.

The competition closed in February 2014 and judging panels were set-up in the 14 countries to select the best national video and other categories (*e.g.* the most informative or creative video). There was also public voting on the best videos via YouTube. A final compilation has been produced featuring all 14 national videos, with English subtitles. It includes an interactive menu that allows the user to choose the videos and a short video introduction showcasing the national winners (see HonkyTonk & Veiga, 2014 – Deliverable 5.2 <http://www.marlisco.eu/video-contest-52.en.html>).



#### 4.2.2 Evaluation survey

A short (one page) online survey was developed in consultation with EUCC to evaluate the Video Contest and assess children's perceptions and behaviours regarding marine litter. The survey formed a quantitative evaluation that children completed pre- and post- participating in the Video contest (based on Hartley, Thompson, & Pahl, 2015). The survey underwent initial piloting and analysis in the UK to ensure question items and response formats were clear and age appropriate. Only minor edits were made and the survey took approximately 5-10 minutes to complete.

In the survey, children indicated whether they thought litter on the beach and in the sea was a problem and whether they were worried about it on a 4-point scale (not at all, a little bit, quite a bit, a lot). Children's perceptions about the negative impacts that marine litter have were measured with five questions, "Do you think litter on the beach and in the sea is bad for: (a) Animals in the sea? (b) People that enjoy the beach? (c) Human Health? (d) Fishermen? and (e) What the beach looks like?" Children responded to each of these on a 4-point scale (not at all, a little bit, quite a bit, a lot). Children then estimated the percentage of marine litter that is plastic and the time it takes a plastic bottle to degrade (providing a number and circling hours/days/weeks/months/years).

Children's perceptions about the possible different causes of marine litter were measured with five questions, "Why is there litter on the beach and in the sea? (How did it get there?): (a) Because people drop litter on the beach and streets, (b) Because there are not enough bins and litter is not properly collected and stored, (c) Because businesses like cafes, restaurants, and shops cause litter at the coast, (d) Because fishermen and boats release litter in the sea, and (e) Because lots of things we buy have too much packaging that is difficult to recycle". Again, children responded to each of these on a 4-point scale (not at all, a little bit, quite a bit, a lot).

Children then completed five questions assessing their self-reported behaviours, "Have you done the following things in the last week: (a) Picked up litter lying around? (b) Separated your litter for recycling? (c) Bought items with less packaging? (d) Avoided using plastic bags in the supermarket? (e) Used reusable items, not throw away ones? (f) Encouraged family and friends to do all or any of the things above? and (g) Thrown litter on the ground?". Again, children responded to each of these on a 4-point scale (not at all, a little bit, quite a bit, a lot).

Finally children had the opportunity to provide their own suggestions for actions to reduce marine litter, "Do you have any new ideas of what you or other people could do?". Children also provided demographic information, including age, gender, and country of residence. The post-contest survey was identical to the pre-contest survey but had an additional final question "How much did you enjoy taking part in the video contest?", and responded on the same 4-point scale.

The survey was translated for all participating countries by MARLISCO partners. Translations were cross-checked with additional native speakers for accuracy and to ensure the meaning of questions had not been significantly altered in the process. Guidance notes were produced to ensure consistency in implementation of the survey across Europe. MARLISCO partners were responsible for implementing the pre-post survey in their country. An online response tracking tool was developed to record the number of surveys completed online (broken down by country of residence and school postcode).

### 4.3 Results

The results presented below are based on data from children who took part in the Video Contest and who participated in the pre- and post-contest survey (note: some children participated in the competition but did not complete the pre- and/or post survey, so we were unable to obtain matched responses). Where we report differences, these are based on statistically significant results from a number of Wilcoxon matched-pair signed rank tests for predominantly ordinal, non-parametric data. Results are described below and figures are provided to highlight pre- and post-contest changes in attitudes and reported behaviours.



### 4.3.1 Summary of respondents

A total of 341 children (200 girls, 141 boys) participated in the Video Contest and pre-post survey across Europe. A breakdown of the sample by country of residence and age is shown below in Table 3.1 and Figure 3.1, respectively (no responses could be matched for Bulgaria and Denmark so they are not listed in Table 3.1 and do not feature in the results). Children ranged in age from 7-18 years but the majority of children were 12-17 years old (Mean age = 13).

Table 3.1: Number of respondents by country of residence

Country of residence	N
PORTUGAL	91
FRANCE	64
UK	57
NETHERLANDS	34
CYPRUS	24
GERMANY	21
ITALY	19
SLOVENIA	11
IRELAND	8
TURKEY	6
ROMANIA	4
SPAIN	2
TOTAL	341

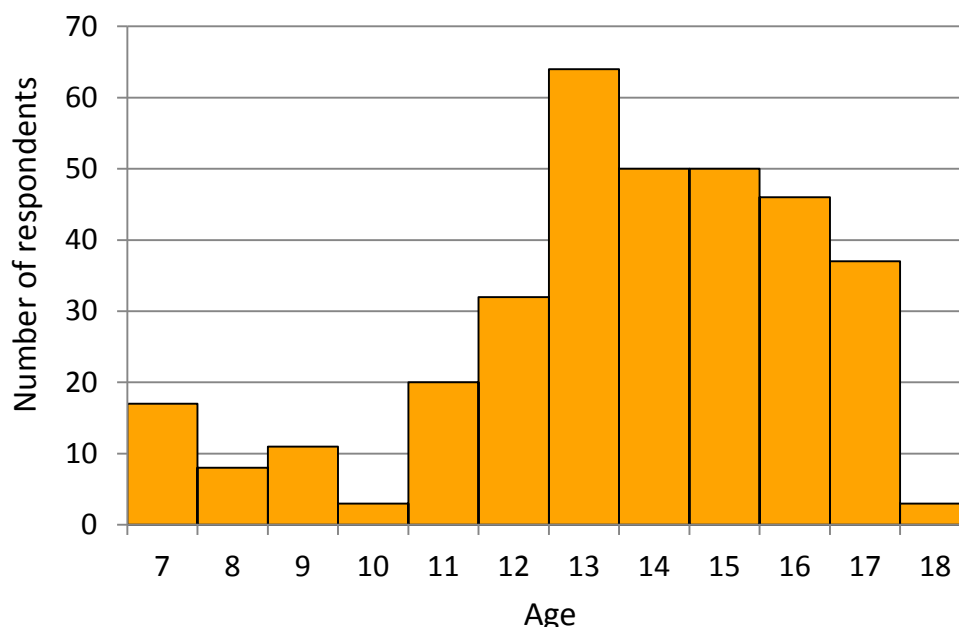


Figure 3.1. Age of children in the sample (those who participated in the Video Contest and completed the pre-and post-survey)

At the end of the post-contest survey, children also rated how much they enjoyed taking part in the video contest. As Figure 3.2 shows, the majority of children enjoyed participating a lot.

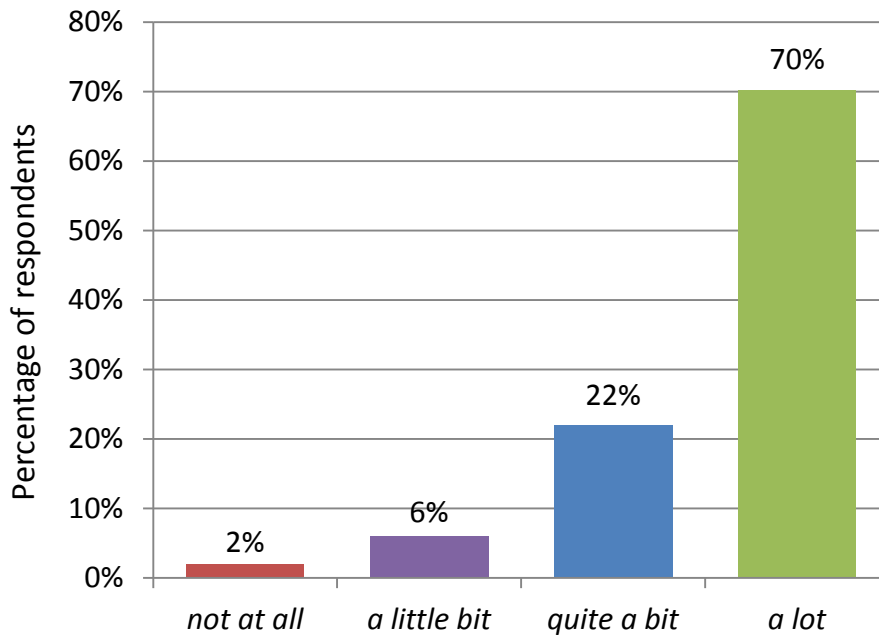


Figure 3.2. The extent that children enjoyed taking part in the Video Contest (1-4 scale: not at all – a lot)

#### 4.3.2 Children's problem awareness and concern

Children judged marine litter to be a very important problem before participating in the video contest and this did not change after taking part; it was already at the upper end of the scale – a 'ceiling effect' (Figure 3.3). Children also reported being very worried about the problems that marine litter might cause, and this significantly increased after participating in the contest.

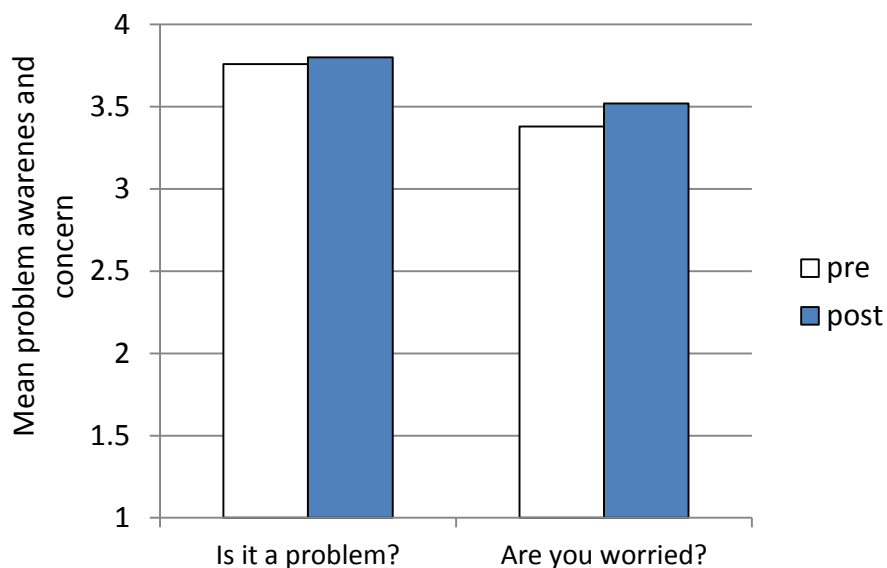


Figure 3.3. Children's problem awareness and concern about marine litter pre- and post-contest (1-4 scale: not at all – a lot)



### 4.3.3 Perceived proportion of plastic and estimated degradation time

Children's pre-contest responses show on average they estimated that 65% of marine litter is composed of plastic and that a plastic bottle would take approximately 100 years to breakdown/degrade (Figure 3.4a and 3.4b). After participating in the contest, children's estimates had significantly increased, reporting that plastic represents 73% of marine litter and a plastic bottle takes approximately 200 years to degrade.

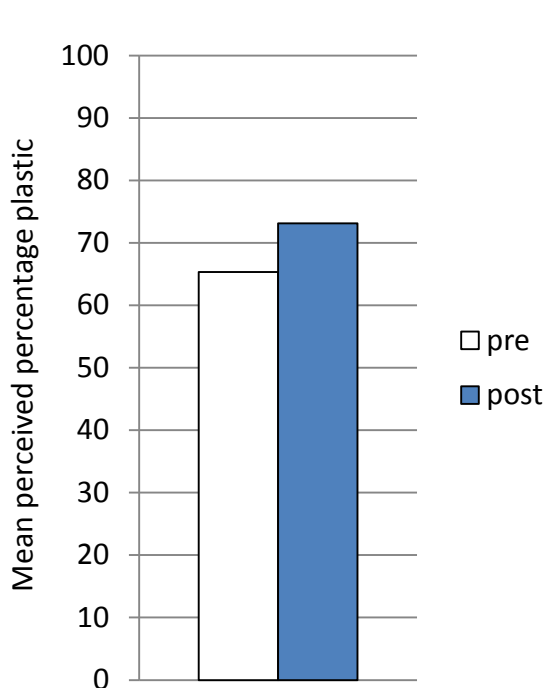


Figure 3.4a. Children's belief about the percentage of marine litter that is plastic pre- and post-contest

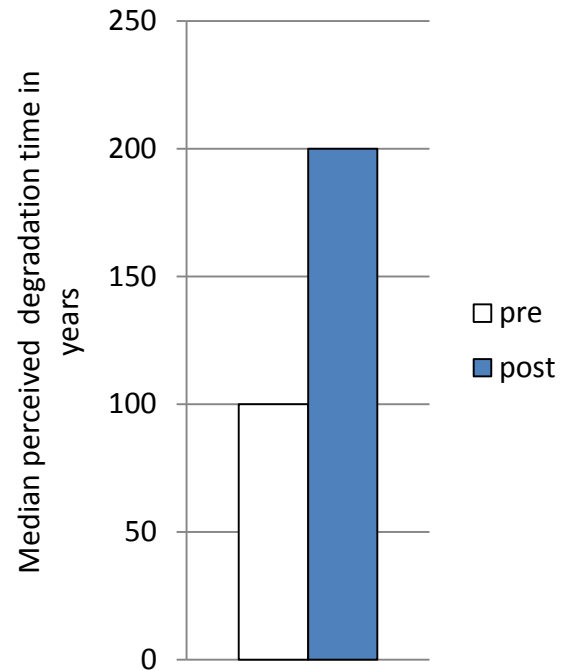


Figure 3.4b. Children's estimate of the time it takes a plastic bottle to degrade pre- and post-contest. Median figures are presented because means (pre: 15533 years, post: 27119 years) are skewed heavily by certain outliers (a few children who estimated very high number of years)

### 4.3.4 Perceived impacts

Five questions assessed children's perceptions about the variety of negative ecological and socio-economic impacts that marine litter can have. Children's pre-contest responses indicate that they perceive marine litter to negatively affect animals in the sea, what the beach looks like, human health, fishermen, and people that enjoy the beach (Figure 3.5). Children perceived the largest negative impact for animals in the sea, and the smallest impact for people that enjoy the beach. After participating in the contest, children's perceptions about the negative impacts for what the beach looks like, human health, and people that enjoy the beach significantly increased. Children's perceptions about the negative impact for fisherman increased slightly after participating in the contest, and their perceptions about the impact on animals in the sea did not change (it was already at the upper end of the scale). The pattern of beliefs (about the largest to smallest impact) remained the same.

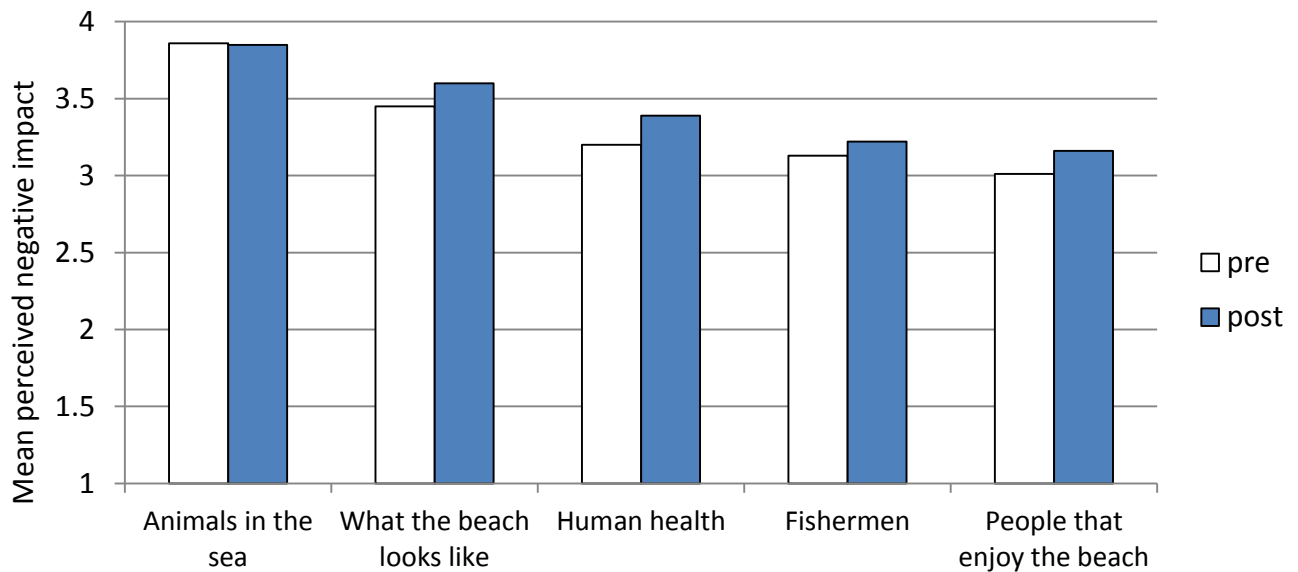


Figure 3.5. Children's perceptions about the negative impacts of marine litter pre- and post-contest (1-4 scale: not at all – a lot)

#### 4.3.5 Perceived causes

Five questions assessed children's perceptions about the potential causes of marine litter. Children perceived that people dropping litter, fishermen and boats, too much packaging, coastal businesses and a lack of bins (Figure 3.6). People dropping litter on the beach and streets was perceived as the largest cause of marine litter, and a lack of bins and coastal businesses were perceived as the smallest causes. Children's perceptions about the role of every factor in contributing to marine litter increased, but and pattern remained the same in terms of which factors were believed to be the largest and smallest causes.

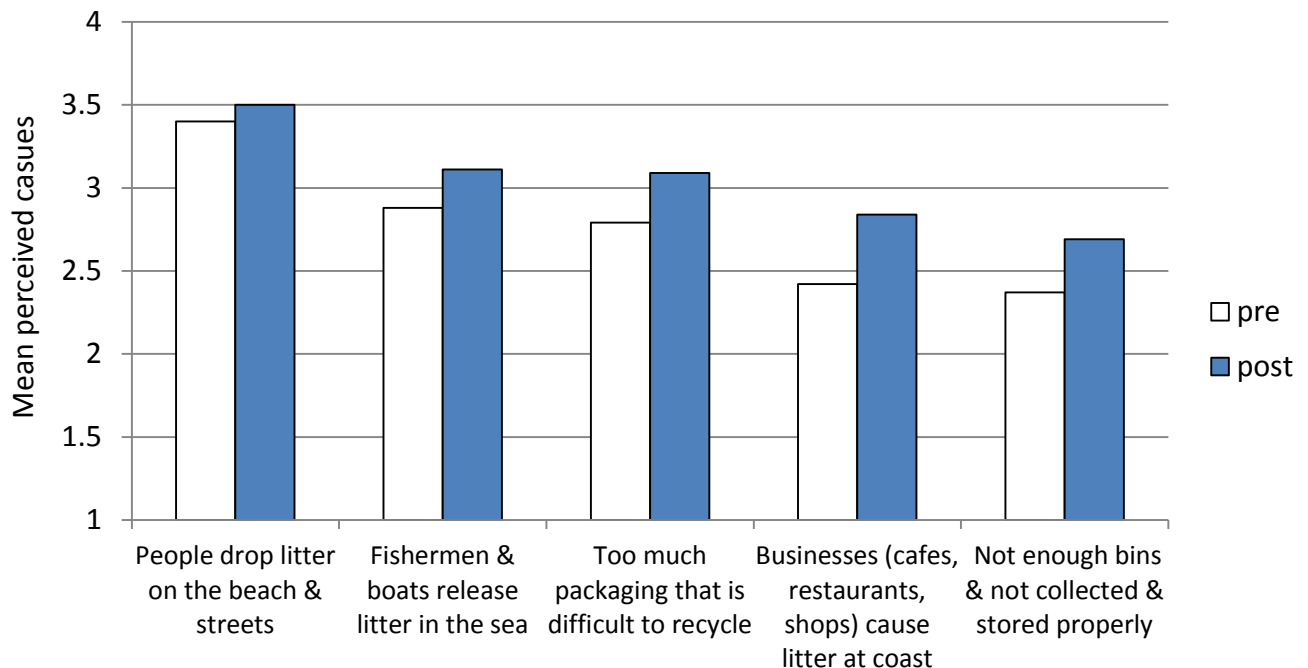


Figure 3.6. Children's perceptions about the causes of marine litter pre- and post-contest (1-4 scale: not at all – a lot)





#### 4.3.6 Actions to reduce the possible causes of marine litter (self-reported)

Pre-contest responses show that children reported performing a number of actions to reduce the potential causes of marine litter (Figure 3.7). Children reported separating litter for recycling the most; using reusable items and avoiding using plastic bags a little - quite a bit; picking up litter, buying items with less packaging, and encouraging others to take positive actions a little bit, and throwing litter on the ground the least. After participating in the video contest, children reported taking positive actions to reduce marine litter significantly more often. The amount that children reported throwing litter on the ground did not change after participating in the contest (it was already at the lower end of the scale).

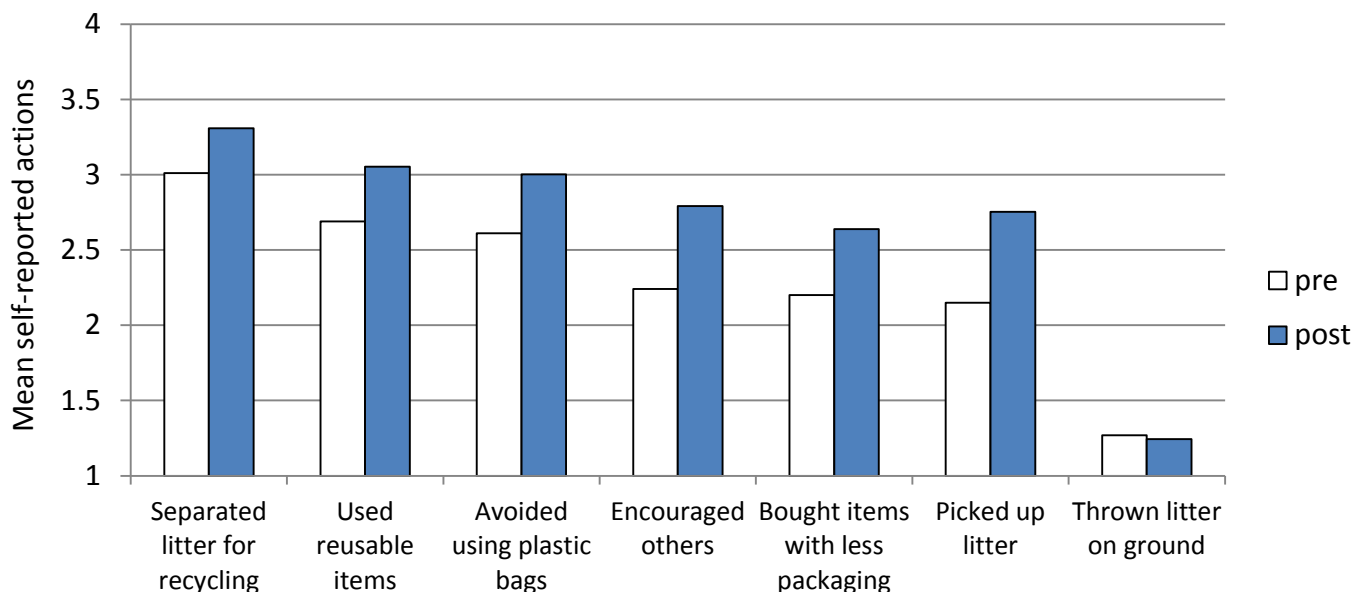


Figure 3.7. Children's reported actions to reduce the potential causes of marine litter pre- and post-contest (1-4 scale: not at all – a lot)

#### 4.3.7 Demographics associated with children's concern, understanding and actions

We conducted a number of Spearman's rank-order correlations to examine whether children's age and gender were associated with the baseline level of concern they reported, their understanding of causes and negative impacts, and the actions they reported taking. The correlations we report here are statistically significant but are small, so caution should be applied drawing conclusions from these. Girls tended to perceive marine litter as a slightly greater problem than boys ( $r_s = .12$ ), and as having a greater negative impact on animals in the sea ( $r_s = .13$ ) and human health ( $r_s = .11$ ) than boys. Girls perceived people dropping litter on the beach and streets ( $r_s = .17$ ) and excess packaging that is difficult to recycle ( $r_s = .12$ ) as greater causes of marine litter than boys. Girls estimated a greater percentage of marine litter to be plastic than boys ( $r_s = .12$ ). In terms of actions, girls reported that they threw litter on the ground less than boys ( $r_s = -.23$ ).

Older children tended to perceive marine litter as having a slightly greater negative impact on human health than younger children ( $r_s = .22$ ). Older children perceived that people dropping litter on the beach and streets ( $r_s = .15$ ) and a lack of bins and proper collection ( $r_s = .14$ ) were greater causes of marine litter than younger children. Older children also estimated a greater percentage of marine litter to be plastic ( $r_s = .17$ ) and perceived plastic took longer to degrade ( $r_s = .29$ ) than younger children. Finally, older children tended to report that they separated litter for recycling more than younger children ( $r_s = .12$ ) and picked up litter lying around less than younger children ( $r_s = -.24$ ).



#### 4.3.8 *Comments and ideas from children about solutions and actions we can take*

We also gave children the opportunity to provide some of their own ideas about what they or others could do to reduce marine litter. Some of children's responses from the UK (provided in English) are presented below and many children suggested that people should watch and share the films that they made in the Video Contest.

*Share our films, make posters to put up in messy areas and provide more trash bins*

*Put adverts on TV and posters near the coast to remind people of why it is important*

*You could write letters or leaflets about marine litter. Get the Government involved.*

*See the films we made. Put them on TV or get the message on the radio.*

*Watch our films*

*The use of bins makes it easier for people to throw their rubbish away. Placing more bins on the beach will help the reducing of litter.*

*Make packed lunches at home and re-use containers rather than bought packaging.*

*Spread the word from our films tell other classes and schools*

*Watch the Marlisco films in all the countries and you could use them as trailers at the cinemas.*

*Make it more fun to recycle, like collect points, get money back*

*Let us all go as a group and collect litter regularly at the beach*

*See our films and share them with others*

*Put posters up around the village/town about the effects about the plastic in the sea.*



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no [289042].



#### 4.4 Discussion

The Video Contest was designed to engage children across Europe in the issue of marine litter and motivate them to learn about the causes, negative impacts and solutions to the problem, and how they can get involved and help reduce marine litter. Results indicate that through participating in the Video Contest children showed an increase in their concern about the problem, their understanding of the various causes and negative impacts, and their practical actions to reduce marine litter. These results are largely consistent with recent findings from a survey with UK children that evaluated the impact of an educational activity to raise awareness about marine litter (Hartley et al., 2015). The Video Contest is a good example of an educational activity that can foster a sense of citizenship and ownership in the younger generation and give them an active voice in such a societal problem. The videos also have the potential to serve as messages that can be used to inform and trigger awareness in a wider audience – indeed this was one of the key suggestions that children made as to what should be done next.

It is important to keep in mind that there was flexibility between countries as to the most appropriate age-range to target at the national level, based on the suitability of the video contest and the theme to the school curricula and activities. Also, it is likely that there was considerable variability in how individual children, teachers, and schools approached the competition, how much extra information they researched, what focus they took etc. Despite this high level of flexibility and variation in the sample and approach, the evaluation demonstrates the positive effect that participating in the video contest had on children's understanding and engagement in solutions across Europe.



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no [289042].



## 5 DATA SURROUNDING THE PUBLIC EXHIBITIONS

### 5.1 Introduction and aims

The aim of the Public Exhibitions was to engage the general public in the issue of marine litter and raise awareness about the problems and solutions. The Exhibitions were designed to inform and inspire action in the general public in an accessible and engaging medium with scientific information and collaboration with national artists.

The survey implemented alongside the Exhibition sought to assess:

- How concerned visitors to the exhibition report being about marine litter
- What the European general public will pledge to do to reduce marine litter when visiting and learning about the issue - how many and what actions will the public pledge to do?
- Whether demographic factors (age and gender) were associated with the public's level of concern and the number of pledges they make

### 5.2 Method/implementation

#### 5.2.1 *The Exhibition*

A series of posters and interactive exhibits documented the composition, sources, and impacts of marine litter and possible solutions to tackle the problem.

The Exhibition covers the following 10 thematic units:

- Marine Litter: An issue of global concern
- Where does it come from?
- How threatening is it?
- How does it affect wildlife?
- How does it affect people?
- What are the challenges for my regional sea?
- What are the challenges for my country?
- Are there solutions?
- What can I do?
- MARLISCO, partners, sponsors, etc

The concept of the exhibition was based on the use of barrels, a symbol for marine waste in many peoples' mind; the use of the blue colour of the sea and the horizon (see Alampei, 2013). It is produced with green, sustainable standards with close to zero waste in itself (all of its elements can be reused or recycled). The exhibition was implemented in 14 countries across the consortium, facilitated and organised by national partners at a wide variety of locations, including at museums, aquariums, galleries, research centres, schools, and beaches. National partners had the flexibility to adjust it and produce parts of it, in a way that best fit their needs. The first exhibition was opened in October 2013 and the exhibition continues to travel across Europe at the time of writing (May 2015). For more information about the Public Exhibitions go to <http://www.marlisco.eu/exhibition.en.html>



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no [289042].



### 5.2.2 The survey

A short survey was developed in consultation with MIO-ECSDE as a snapshot of visitor perceptions at the exhibitions and as a tool to encourage the public to pledge to take action. The survey was designed to gauge visitors' level of concern about marine litter whilst at the exhibitions across Europe, and measure the number and type of pledges to reduce marine litter that visitors were prepared to make. Visitors to the exhibitions were free to participate in the survey, which took approximately 2 minutes to complete. The survey was either completed on paper or via an iPad, phone or computer (this varied from country to country). Visitors were asked to indicate "Are you concerned about marine litter?" on a 4-point scale (no, not concerned; a little bit concerned; quite concerned; extremely concerned). Visitors were also asked to "Make a pledge – Tick all that you will do... (a) Pick up litter lying around, (b) Separate my litter for recycling, (c) Buy items with less packaging, (d) Avoid using plastic bags in the supermarket, (e) Use reusable items, (f) never throw litter anywhere, in the streets, parks or beaches, and (g) Encourage family and friends to do any or all of these things. Visitors were also asked to record the three key things that stuck in their mind from the Exhibition, to offer a more qualitative look at visitors' engagement in the exhibition and reaction to it.

The survey was translated for all participating countries by MARLISCO partners. Translations were cross-checked with additional native speakers for accuracy and to ensure the meaning of questions had not been significantly altered in the process. MARLISCO partners were responsible for implementing the survey in their country. An online response tracking tool was developed to record the number of surveys completed online (broken down by country of residence).

In some cases, such as for Netherlands and Greece, informal ways to collect responses were also used. For example in Greece, in several exhibits visitors were asked to note down their own pledge in a speech bubble similar to the Exhibition bubbles as shown below (i.e. sentences starting with active verbs such as I follow..., I reduce..., I reuse ..., I remember that ..., I inform ..., I respect ..., I take part ..., etc.) resulting in hundreds of diverse pledges about concrete action steps they themselves can take to reduce littering.





### 5.3 Results

Note that where we report differences, these are based on statistically significant results.

#### 5.3.1 Summary of respondents

A total of 1842 visitors participated in the Exhibition survey across Europe. A breakdown of the sample by country of residence and age is shown below in Table 4.1 and Figure 4.1. Visitors who completed the survey ranged in age from 4-102 years (Mean age = 25) and a large number of visitors participating in the survey at the Exhibition were children and adolescents - possibly because of school classes visiting (Figure 4.1).

Table 4.1: Number of respondents by country of residence

Country of residence	N
TURKEY	281
ROMANIA	248
FRANCE	240
UK	235
PORTUGAL	214
SLOVENIA	195
DENMARK	153
ITALY	60
CYPRUS	57
BULGARIA	44
IRELAND	43
GERMANY	37
NETHERLANDS	26
GREECE	9
Total	1842

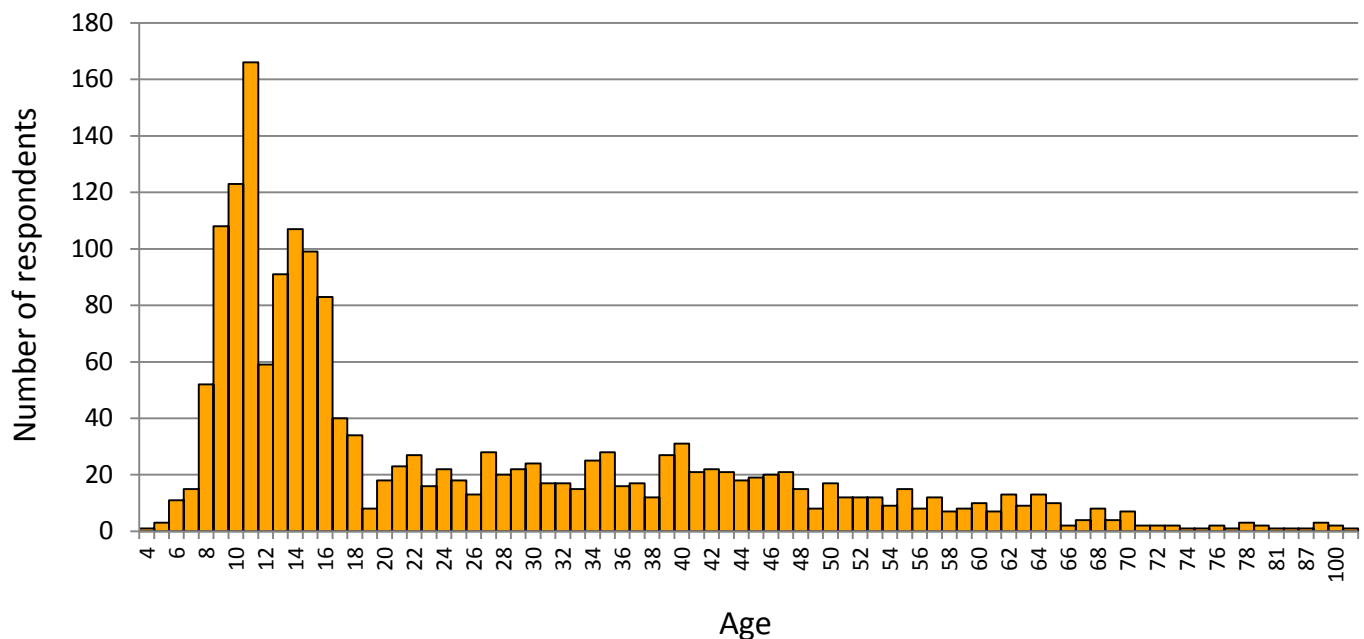


Figure 4.1. Reported age of visitors to the Exhibition who completed the survey



### 5.3.2 Visitor concern about marine litter

The majority of visitors who completed the survey were quite concerned or extremely concerned about marine litter and only 4% reported that they were not concerned (Figure 4.2).

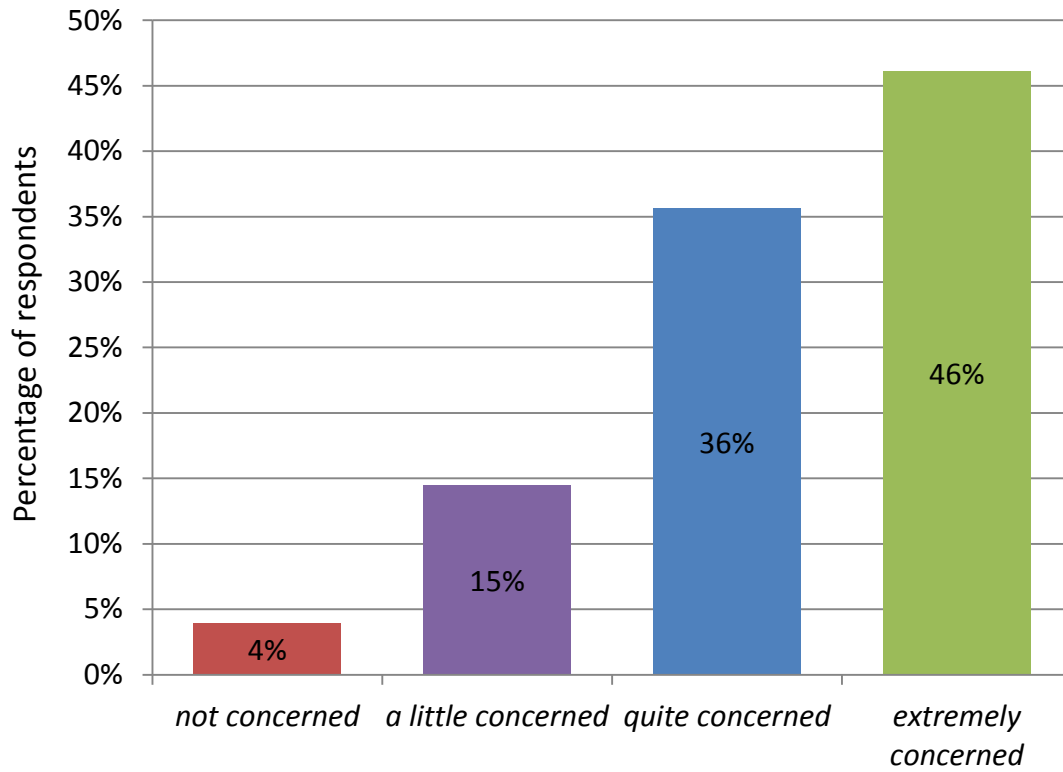


Figure 4.2. Visitors' level of concern about marine litter at the Exhibition



### 5.3.3 Visitor pledges to reduce marine litter

Visitors could pledge to take up to seven actions to reduce marine litter. The majority of visitors who completed the survey pledged to take a total of five or more actions, and many respondents pledged to take three or four (Figure 4.3). Very few visitors who took part in the survey only pledged to take one or two actions and only 2% did not make any pledges at all. Visitors were most likely to pledge to avoid using plastic bags in the supermarket and least likely to pledge to encourage family and friends to take similar actions (Figure 4.4).

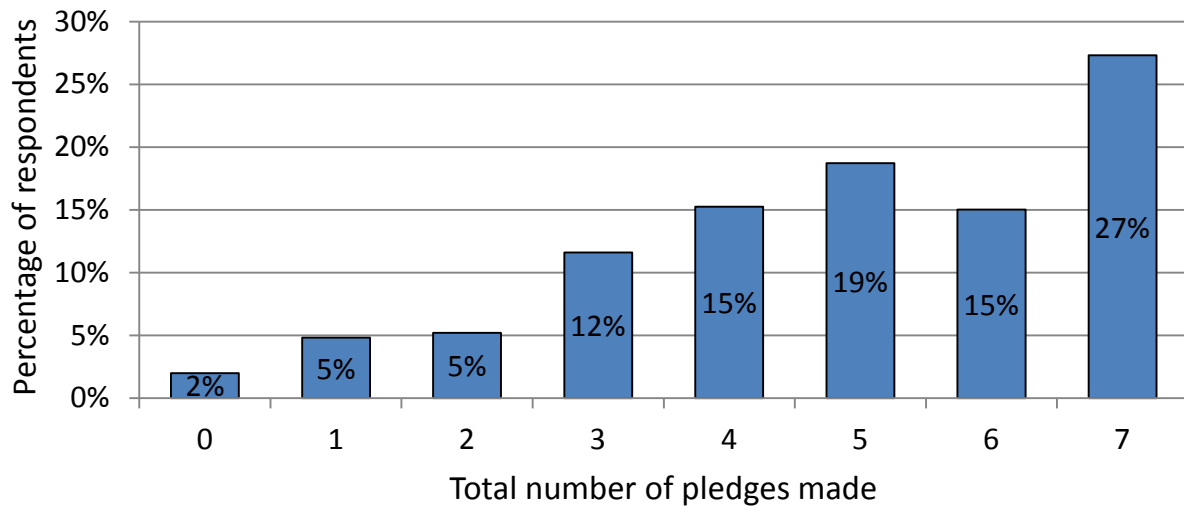


Figure 4.3. The number of pledges made by visitors at the Exhibition to help reduce marine litter (from zero pledges, up to the maximum of 7 pledges).

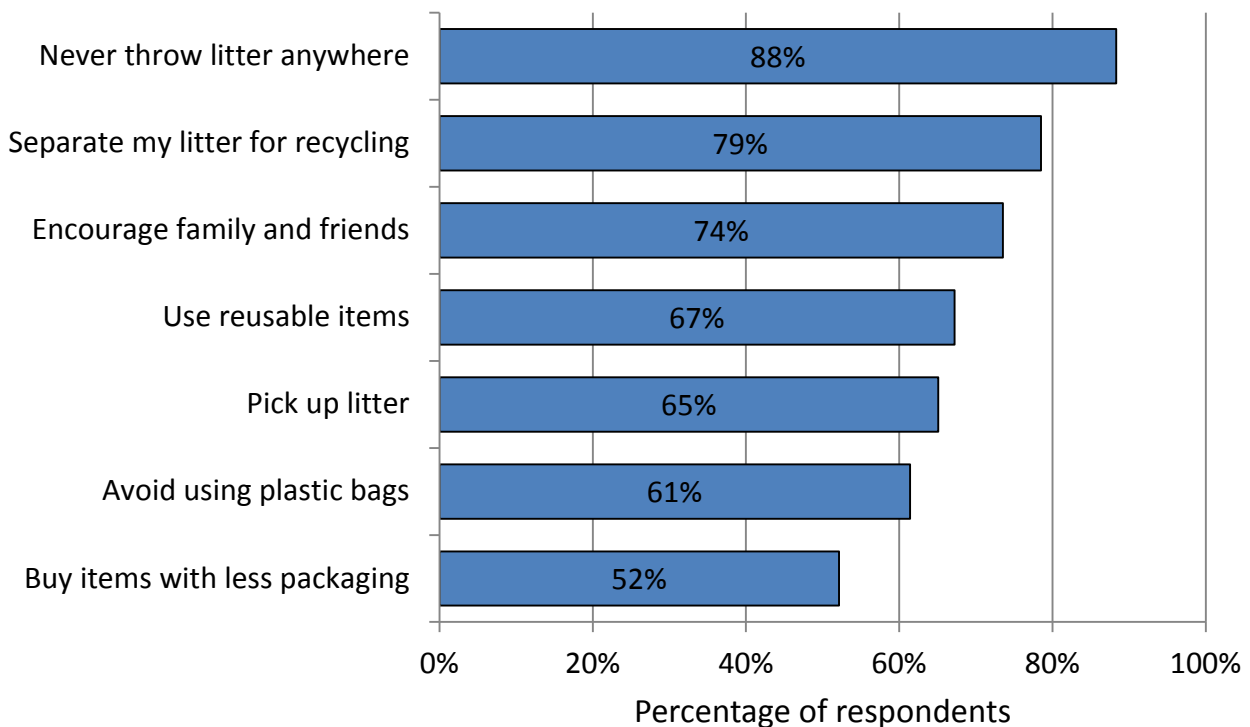


Figure 4.4. The percentage of visitors and type of pledge made at the Exhibition to help reduce marine litter





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#### **5.3.4 Demographic factors associated with concern and number of pledges**

We conducted a number of correlations to examine whether visitor age and gender were associated with concern and number of pledges made. The correlations we report here are statistically significant but are small, so caution should be taken in drawing conclusions from these. Gender was not significantly correlated with level of concern about marine litter or total number of pledges made. Gender was only correlated with one pledge 'Avoid using plastic bags', such that women were more likely than men to pledge to avoid using plastic bags. Older participants reported greater concern ( $r = .14$ ) and made more pledges ( $r = .15$ ) than younger participants. In addition, the level of concern that visitors reported when visiting the exhibition was positively correlated with the total number of pledges made ( $r = .31$ ); visitors who reported greater concern made more pledges to take action to reduce marine litter.



### 5.3.5 Visitor reaction to the Exhibition: Qualitative responses (quotes) about key aspects of the Exhibition that resonated most with visitors

The quotes below and on the next page highlight some of the open-ended responses that visitors provided when describing the memorable aspects of the Exhibition. We have selected some examples from the English responses (from the UK and Ireland) and divided these into three overarching themes: (a) the problem, including the scale of the problem, the predominance of plastic and the causes of marine litter, (b) the quality of the display and facilitation, and (c) the need for change and solutions. These relate to the main exhibition objective to raise awareness about the problems and solutions to marine litter, and inspire action in the general public in an accessible and engaging medium. We have not presented quotes relating to elements of the exhibition or accompanying artwork that were country-specific.

#### (a) The problem

*It's a problem of global proportions.*

*Excessive waste from human consumption*

*So much of what we throw away we didn't need in the first place.*

*Our modern throwaway society encourages waste*

*The volume of waste & packaging that ends up in the marine environment*

*A reminder of the sheer quantity of waste polluting our environment*

*A lot of the items come from supermarkets. How do they take accountability?*

*Where does it all come from? Shocked at the amount.*

*The amount of plastic I still use though trying to avoid it.*

*Lack of awareness regarding harmfulness of plastics.*



### (b) The display

*Poster aesthetics are amazing.*

*Thought provoking.*

*The creativity of the exhibitors, and hope for change and raising awareness.*

*Friendly informative helpers.*

*How rubbish can turn into a work of art*

*Opening eyes to the problem.*

### (c) The solutions and need for action

*More action needs to be taken on marine pollution at international government levels.*

*It's all very avoidable.*

*Manufacturers role in reducing waste.*

*Must do more.*

*Individual contributions can reduce waste in the oceans (or reduce waste in general)*

*This needs to change.*

*How easy it is to make a difference.*

*We must do something.*

*Simple changes can reduce the impacts.*

*The importance of using reusable items and recycling.*

*Educate educate educate. We have to stop producing so much pointless plastic!*



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## 5.4 Discussion

The exhibition was designed to engage the European general public in the issue of marine litter and raise awareness about the problems and solutions and inspire action. Results from the survey indicate that the majority of visitors to the exhibition reported being concerned about the issue. It is encouraging that visitors also made many pledges to take actions to reduce marine litter and be part of the solution. These findings are very interesting, and indicate what the European general public will pledge to do to reduce marine litter when visiting and learning about the issue.

However, due to the nature and layout of the different exhibitions across Europe and many locations, there was not always precise control over when visitors would complete the survey (i.e., when they arrived, during the exhibition, or when they left). In addition, the short survey at the exhibition was designed as a snapshot of visitor perceptions. It was not feasible to conduct a before-after style survey to evaluate changes in perception. Therefore, it is not possible to draw conclusions about the impact of the exhibition on visitor perceptions without a baseline or control measure. The opportunity for before-after data is an advantage of the other three activities and evaluations (National Fora, Video Contest for School Children, and E-learning for Educators) reported in this deliverable.



## 6 EVALUATION OF THE E-LEARNING COURSE FOR EDUCATORS

### 6.1 Introduction and aims

The aim of the E-course and Educational Pack was to inform, sensitise and enable European teachers to take action to tackle the issue of litter in our seas and coasts. More specifically, the E-course sought to train educators how to use the EduPack, and create confidence and intention to integrate marine litter education and the pack in their teaching practice (i.e., it had pedagogical focus rather than to teach teachers about marine litter).

The evaluation implemented alongside the E-course sought to assess:

- Educators' attitudes about marine litter (concern, understanding, confidence and sense of responsibility)
- How educators' attitudes changed after participating in the E-course
- Educators' intentions to integrate marine litter education into their teaching

### 6.2 Method/implementation

#### 6.2.1 The E-course

The course was implemented in two rounds and promoted by national partners in the MARLISCO consortium to recruit formal and non-formal educators to participate. Round 1 ran from 23 to 30<sup>th</sup> June 2014 and acted as a pilot for revising the educational material and activities to replicate in Round 2. Round 2 ran from 9<sup>th</sup> to 20<sup>th</sup> January 2015 and applied the final formatted EduPack *'Know, Feel, Act! to Stop Marine Litter: Lesson plans and activities for middle school learners'* (Scoullos, Alampe, Malotidi, & Vlachogianni, 2014). In this report we only discuss the results of Round 2.

During the e-course an overview of the educational pack was presented to educators, and effective ways of incorporating it in real life were demonstrated. Trainers and learners shaped a highly interactive learning community that simulated selected activities of the pack, tested their validity and appropriateness, and suggested ways to adjust and improve them. Learners were treated as experts and the course gave participants the opportunity to talk about the obstacles they face in implementing the activities and exchange views on ways to overcome them.

The course was implemented in English and educators were only accepted onto the course if they had good understanding of English. The course ran for approximately 16 hours over 12 days (i.e., 1-2 hours daily) and this was designed to be similar to a 1.5-2 day face-to-face seminar with the aim to train learners on effective ways of teaching about marine litter. Learners and facilitators did not need to be online at any specific time; they could log in at any time convenient to them. For more information about the E-learning and Educational pack go to <http://www.marlisco.eu/education.en.html>

#### 6.2.2 Evaluation survey

A short online survey was developed in consultation with MIO-ECSDE to evaluate the e-learning course. The survey was integrated into the e-learning course platform and formed a quantitative evaluation that participants completed before they began the training course (pre) and again after (post). The survey was developed in English and underwent initial piloting and analysis in the UK to ensure clarity of questions, and to determine duration. Only minor edits were made and each part of the survey took approximately 5-10 minutes to complete.

The pre-course survey included a set of questions specifically designed to assess educators' attitudes about marine litter in terms of their concern, understanding, confidence and sense of responsibility (e.g., "I think marine litter is a very important problem"; "I feel a responsibility to educate young people about the topic of marine litter"; "I feel I have the skills to teach about marine litter"; "I have lots of ideas for teaching about marine litter"). Specifically, educators' were asked to indicate whether they agreed or disagreed with these statements on a



scale from 1 (strongly disagree) to 7 (strongly agree). Demographic information (gender, age, country of residence, and role in education) was also provided

The post-course survey included the same questions and a second set of questions designed to assess educators' intentions to integrate marine litter education into their teaching (e.g., "I plan to develop lessons or activities about marine litter"; "I will encourage other educators in my network to use the Education Pack on marine litter"). Educators were asked to indicate their intentions on a scale from 1 (no, definitely not) to 7 (yes, definitely). The post-course survey also included some general course feedback questions and a comment box (e.g., "The course... was relevant and well-linked to the EduPack; was the right level of complexity; gave me a good chance to voice my opinions in discussions; achieved its objectives described in the beginning"). Educators were asked to indicate whether they agreed or disagreed with these statements on a scale from 1 (strongly disagree) to 7 (strongly agree) (see figures in Results section).

### 6.3 Results

The results presented below are based on data from educators who completed the e-course in full and who participated in the pre- and post-course survey (note: some educators participated in the course but did not complete the pre- and/or post survey, so we were unable to obtain matched responses). A breakdown of the sample by country of residence is shown in Table 5.1. Where we report differences, these are based on statistically significant results from an ANOVA and (matched) paired *t*-tests.

#### 6.3.1 Summary of respondents

From the total 122 e-course registered trainees, a total of 72 individuals (58 females, 14 males) took both the e-course pre and post survey across Europe, which is in itself a very satisfying completion rate, much higher than the average global completion of e-courses. Note: five educators took part from outside the MARLISCO consortium of participating countries and are included in the analyses. Educators ranged in age from 20-59 years (Mean age = 36). The sample included 14 individuals who work in formal education (e.g., teachers), 26 in non-formal education (e.g., NGO and museum staff, surfers, divers, activists), 22 in both formal and non-formal education, and 10 who specified another field 'other' (e.g., university students).

Table 5.1: Number of respondents by country of residence

Country of residence (MARLISCO consortium)	N
ROMANIA	12
IRELAND	10
UK	10
PORTUGAL	8
ITALY	6
GREECE	4
GERMANY	3
TURKEY	3
DENMARK	2
BULGARIA	1
FRANCE	1
NETHERLANDS	1
SPAIN	1
OTHER (USA, Switzerland, Sweden, Croatia, Tunisia)	5
Total	72



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### **6.3.2 Attitudes pre- and post- training**

Seven questions assessed educators' attitudes about marine litter, including their concern, understanding, confidence and sense of responsibility. Educators judged marine litter to be a very important problem before participating in the e-course and this did not change after completing the course; it was already at the upper end of the scale – a 'ceiling effect' (Figure 5.1). Educators also felt a very high level of responsibility to educate young people about marine litter before starting the course, and this increased a little after the course. Whilst educators agreed that they had some knowledge and understanding about marine litter before participating in the course, after completing the course educators reported that they knew and understood significantly more about the topic.

In addition, educators felt somewhat confident in their skills and abilities to teach about marine litter before taking the e-course, and felt they had some ideas about integrating the topic into their teaching. After completing the course their confidence and perceived abilities had increased significantly (Figure 5.1). Moreover, educators' confidence about how receptive young people would be to learning about marine litter significantly increased after participating in the course. Educators' tendency to neither agree nor disagree that marine litter would be somewhat challenging to integrate into their teaching did not change after participating in the course, but as we present in the next section, this did not appear to impede their intentions to integrate the topic and EduPack into their teaching.

### **6.3.3 Intentions to integrate marine litter education into teaching**

Eight questions assessed educators' intentions to integrate marine litter education into their teaching. After completing the course, educators indicated that they intended to increase the amount of marine litter education they provide, develop more lessons and activities about the topic, and encourage other educators in their network to integrate marine litter education and the MARLISCO EduPack into their teaching (Figure 5.2).

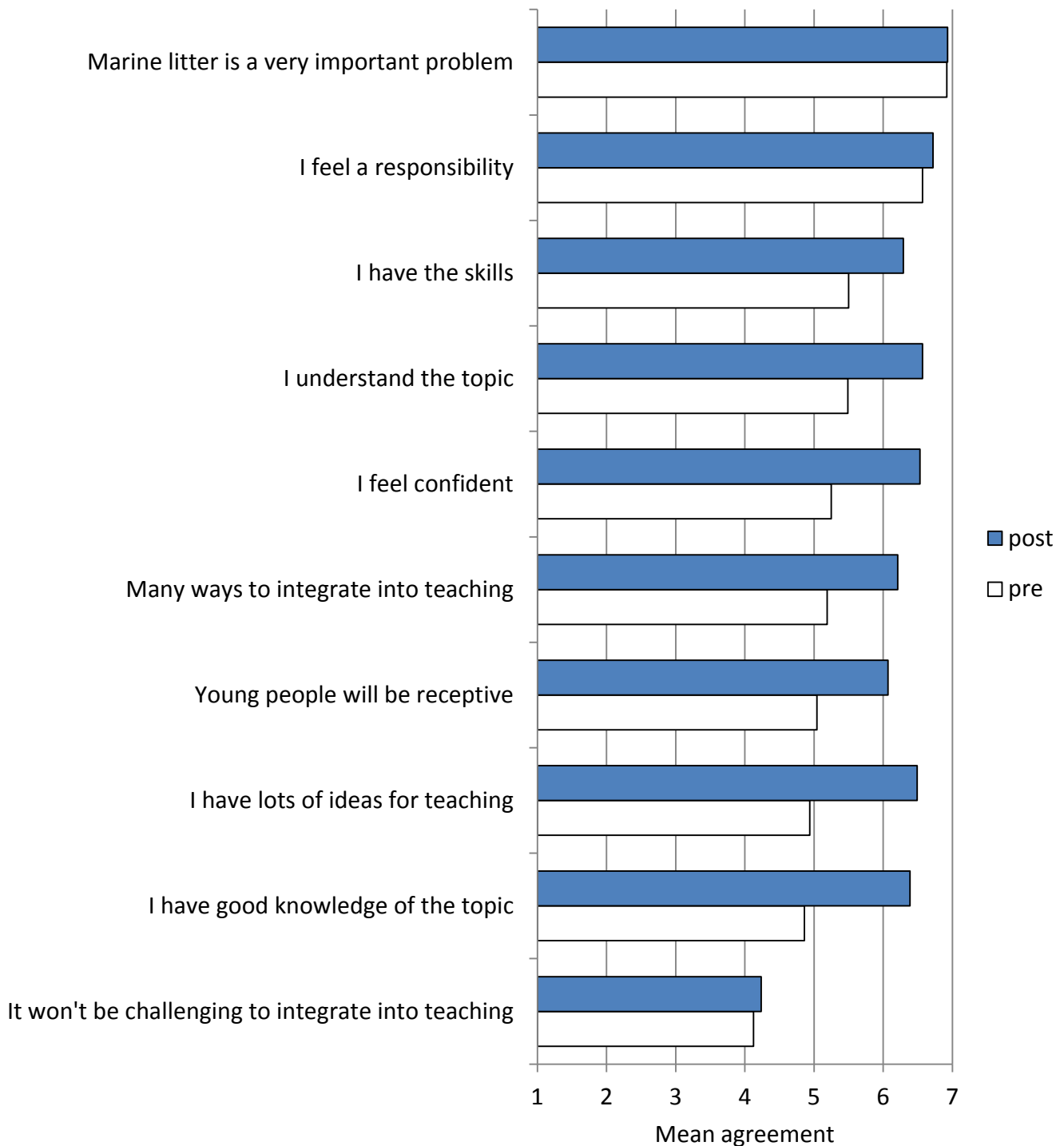


Figure 5.1. Educators' attitudes about marine litter pre- and post-course (1-7 scale: strongly disagree – strongly agree) – (concern about marine litter, sense of responsibility to teach about the topic, understanding and knowledge about the issue, and confidence in skills, abilities and ideas)





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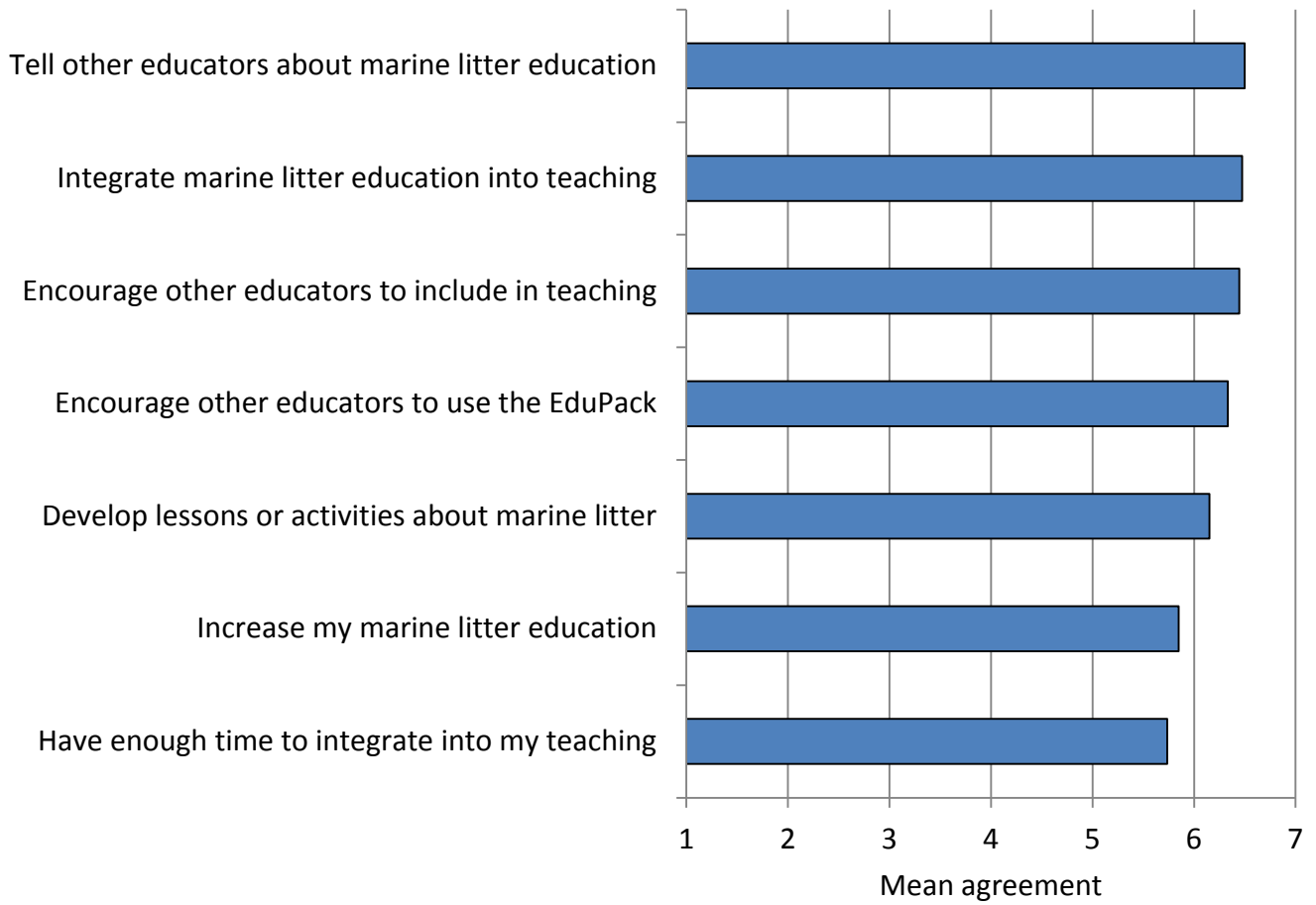


Figure 5.2. Educators' intentions to integrate marine litter education into their teaching (1-7 scale: no, definitely not – yes, definitely)



### 6.3.4 Course feedback and comments from educators

Educators evaluated the e-course very favourably, giving high scores for the way in which the course was delivered (Figure 5.3). The quotes on the page that follows highlight some of the open-ended responses that educators left at the end of the survey which support the more quantitative results presented so far. Educators refer to the course materials, activities and facilitation as increasing confidence and enthusiasm, giving them ideas and encouraging them to integrate marine litter education into their teaching.

#### The E-Course....

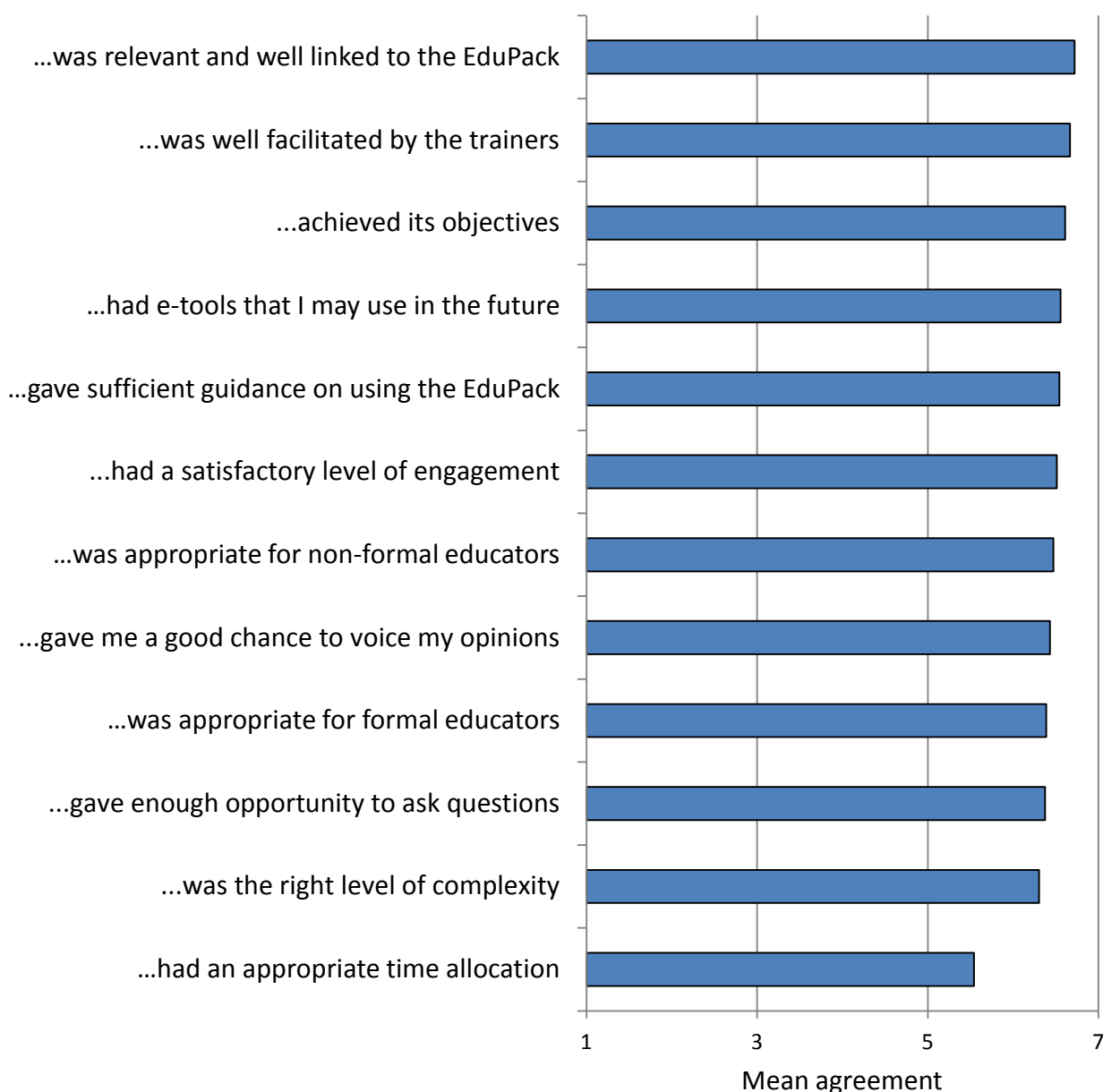


Figure 5.3. Educators' evaluations of the e-learning course (1-7 scale: strongly disagree – strongly agree)



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*I think it was a great course and full of ideas on how to implement fun and educational exercises in a teaching situation. Also, it was really fun to get a chance to connect with people from so many different countries. I chatted with Ireland, Portugal, Romania, Spain - it was great :)*

*I want to congratulate the whole team for their dedication, the huge amount of time and energy they spent on this course. I will definitely use the knowledge I have gained for my classes and activities with our students.*

*Both materials and activities were interesting, they made me think over and over about marine litter, about human ignorance and the future of this planet... I wish you success in trying to change things, certainly I am going to try it myself!*

*Participating in a course with others from around Europe has been a huge privilege! Thank you. I hope to create partnerships with some in the future.*

*What's fantastic about it all is the resource base so we can pursue many different angles to cover the subject of marine litter. Thank you for this, because this has become a high priority in my conscience for making personal changes and for setting up appropriate workshops that magnify how beautiful our world is and what we can do to improve the plastics issues.*

*I really enjoyed this e-course. I think that it's very well designed. The activities were very interesting, creative and so useful for my activity. I have already integrated some activities in my classroom and it was a success. Thank you for this opportunity!*

*I thought the course was fantastic, thank you so much. It has really enthused me. I think I was against e-learning before this course but now really see the advantages of it.*

*For me everything is quite clear now, after completing this course that everybody must be active in preventing or educating about marine debris.*

*Hi, what an amazing course! I'm so grateful for the opportunity to spend time on this structured and informative training programme. There is also loads to take away. I feel incredibly pleased to have got through the course work.*

*I like the idea of an education pack that I can readily use and share with others. The ease at which each module can be managed is good and I think could be easily delivered by non-marine litter specialists.*

*This course was enjoyable and I loved carrying out the prescribed activities. It is a perfect example of how an e-course should be: interactive, engaging and pitched at the right level. I felt that I learned by collaborating with the other learners.*



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## 6.4 Discussion

The Educational Pack and the resulting e-course were designed to inform, sensitise and enable European teachers and students to take action to tackle the issue of litter in our seas and coasts. More specifically, the E-course sought to train educators how to use the EduPack, and create confidence and intention to integrate marine litter education and the pack in their teaching practice. The evaluation survey provided an excellent insight into educators' understanding, confidence and sense of responsibility in integrating marine litter education into their teaching before and after participating in the e-learning course.

Overall, the results indicate that the e-course had a positive impact on educators' confidence in their skills and abilities to teach about marine litter. After completing the course, educators also indicated that they intended to increase the amount of marine litter education they provide, develop more lessons and activities about the topic, and encourage other educators in their network to integrate marine litter education and the MARLISCO EduPack into their teaching. This is particularly encouraging because this will maximise the potential for the training and resources to be distributed more widely and influence education practice.

The interactive e-course represents an excellent tool to build the capacities of educators in applying the educational pack and enable them to integrate marine litter into their teaching. Starting from the contents of the educational pack as basic teaching material the course treats learners as experts that bring in their own ideas to share with others and results in jointly generated outcomes for which the learners feel high levels of ownership. Overall, the e-course provides resources, techniques and ideas to facilitate teaching whilst increasing confidence. This form of training is particularly useful when face-to-face training sessions are not feasible. It also allowed educators from across Europe to work together and communicate best practices and ideas – this would not have been possible if face-to-face national training courses had been organised.

It would be worthwhile for future work to conduct additional follow-up evaluations with the educators and examine how they used the educational pack and what they learnt in the e-course in their own teaching practice, what was successful, what challenges they experienced, and whether they had encouraged other educators in their network to integrate the topic into their teaching. It would also be valuable to follow-up the audiences (i.e., students, youth groups, beach visitors) with whom the educators are working to assess how it increases awareness, understanding, sense of responsibility, confidence and action.



## 7 CONCLUSION

### 7.1 Summary

This report documents the development and results of four European-wide surveys to measure the impact of participation in specific outreach and educational activities on individuals' social perceptions and behaviours regarding marine litter – (1) National Fora, (2) Video Contest for School Children, (3) Public Exhibitions, and (4) E-learning Course for Educators.

Several factors can act as barriers to accepting the marine litter issue and working towards solutions but they also represent opportunities to raise awareness and engage individuals and groups in the topic of marine litter. The evaluation of four educational and outreach activities presented in this report demonstrates the potential for engaging different populations (the general public, children, educators and key stakeholders) in order to raise awareness about marine litter, increase understanding and encourage commitment to solutions.

### 7.2 Challenges and limitations

There are a number of limitations to keep in mind when interpreting the findings of the evaluations documented in this report and we outline these below. There are common limitations to the self-report method of the survey technique when assessing individuals' perceptions. Self-report methods can be subject to socially desirable responding, whereby participants provide responses which are viewed to be desirable in society, or which they believe are consistent with the goals of the survey. For example, respondents may report that they are more concerned about the problem of marine litter than they in fact are, because this is viewed as the more desirable response. Whilst this is a potential limitation, the majority of surveys were completed online which is likely to suffer less from social desirability than a face-to-face interview survey methods.

The four educational and outreach activities presented in this report were conducted and evaluated across several European countries. However, it was beyond the scope of this report to assess detailed results on a country-by-country basis. There would also be difficulty reaching conclusions about cause and effect. Any results varying by country might be due to country-specific differences in how the engagement activities were implemented, sample differences, etc. For example, a balanced spread of responses across countries was not achieved in all cases, and there were a greater number of responses obtained from certain countries, stakeholders, and ages for particular activities. This meant there was insufficient sample size to present results from countries individually or to compare certain countries and maintain reliable or representative findings.

### 7.3 Looking forward

This report provides a key step in understanding societal perceptions toward marine litter across Europe and in gauging the effectiveness of specific outreach and educational activities to change attitudes and behaviour. Understanding societal perceptions and assessing the impact of outreach activities which seek to change individuals' attitudes and behaviours is critical in order to better engage society in the problem and solutions surrounding marine litter. It is hoped that this report will inform academic and applied audiences across the marine, environmental and social sciences interested in evaluating the effectiveness of a variety of outreach and engagement activities concerning environmental issues. For further information and guidance, see [“How to communicate with stakeholders about marine litter – A short guide to influencing behavioural change”](#) (Hartley, Holland, Pahl, & Thompson, 2015).



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