










Communication

ADSWIM and WATERCARE Projects Meet Kids and Youth: The Challenge of Bringing the World of Research to School to Merge Research, Education and Communication

Elisa Baldrighi ^{1,*}, Patricija Muzlovic ^{2,*}, Anna Annibaldi ^{3,4} , Antonella Penna ^{4,5} , Elena Manini ¹ , Elia Rosetti ¹, Enrico Esposito Renzoni ⁶, Federica Grilli ¹ , Gloria Giacomini ⁶, Ivana Kristovic ⁷, Ivo Duracic ⁷, Maja Krzelj ⁸, Marin Ordulj ⁸, Martin Bučan ⁹, Pierluigi Penna ¹ , Vedrana Spada ¹⁰ , Josipa Bilic ¹⁰ , Mauro Marini ^{1,4}  and Sabina Susmel ^{11,*} 

- ¹ National Research Council of Italy—Institute for Biological Resources and Marine Biotechnologies, CNR, IRBIM, 60125 Ancona, Italy; elena.manini@cnr.it (E.M.); elia.rosetti@irbim.cnr.it (E.R.); federica.grilli@cnr.it (F.G.); pierluigi.penna@cnr.it (P.P.); mauro.marini@cnr.it (M.M.)
 - ² LETTERA B SAS, Via Galileo Galilei 22, 33100 Udine, Italy
 - ³ Dipartimento di Scienze della Vita e dell’Ambiente (DISVA), Università Politecnica delle Marche, 60131 Ancona, Italy; a.annibaldi@staff.univpm.it
 - ⁴ Fano Marine Center, The Inter-Institute Center for Research on Marine Biodiversity, Resources and Biotechnologies, 61032 Fano, Italy; antonella.penna@uniurb.it
 - ⁵ Department of Biomolecular Sciences, DISB, University of Urbino, 60129 Urbino, Italy
 - ⁶ ASET SpA, Via Luigi Einaudi, 61032 Fano, Italy; e.espositoRenzoni@aset SERVIZI.it (E.E.R.); g.giacomini@aset SERVIZI.it (G.G.)
 - ⁷ Dubrovnik Neretva Region, 20000 Dubrovnik, Croatia; ivana.kristovic@dnz.hr (I.K.); ivo.duracic@dnz.hr (I.D.)
 - ⁸ University Department of Marine Studies, University of Split, 21000 Split, Croatia; mkrzelj@unist.hr (M.K.); mordulj@unist.hr (M.O.)
 - ⁹ Split Dalmacija Region, 21000 Split, Croatia; martin.bucan@dalmacija.hr
 - ¹⁰ METRIS Research Centre, Istrian University of Applied Sciences, 52100 Pula, Croatia; vspada@iv.hr (V.S.); jbilic@iv.hr (J.B.)
 - ¹¹ Department of Food, Agricultural, Environmental, and Animal Sciences (Di4A), University of Udine, Via Sondrio 2/A, 39100 Udine, Italy
- * Correspondence: elisa.baldrighi@irbim.cnr.it (E.B.); adswimcommunication@gmail.com (P.M.); sabina.susmel@uniud.it (S.S.); Tel.: +39-071-2078868 (E.B.); +34-96-990-658 (P.M.); +39-0432-558110 (S.S.)



Citation: Baldrighi, E.; Muzlovic, P.; Annibaldi, A.; Penna, A.; Manini, E.; Rosetti, E.; Renzoni, E.E.; Grilli, F.; Giacomini, G.; Kristovic, I.; et al. ADSWIM and WATERCARE Projects Meet Kids and Youth: The Challenge of Bringing the World of Research to School to Merge Research, Education and Communication. *Water* **2022**, *14*, 1843. <https://doi.org/10.3390/w14121843>

Academic Editor: George Arhonditsis

Received: 2 May 2022

Accepted: 6 June 2022

Published: 8 June 2022

Publisher’s Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Abstract: The transfer of communication and knowledge from science and research to the general public is a paramount step to raise people’s awareness about environmental issues and their negative and positive impacts on each of us. Many projects and initiatives seek to raise awareness among citizens, with particular attention to young people, about the importance of maintaining clean and healthy oceans. With this paper, we aim to present the successful communication initiatives developed during two Interreg projects, AdSWiM and WATERCARE, with schools and educational organisations on the local and national levels in Italy and Croatia. Both projects make a special effort to realize dedicated communication strategies with the objective of raising the awareness of environmental topics and issues among young people (i.e., students of different school grades) and teachers. The promotion of ocean literacy among students is crucial, as children and young people represent the future citizens and consumers who will develop attitudes and make decisions that will inevitably affect the environment.

Keywords: good practice; ocean citizenship; communication plan; youth; water quality; wastewater management; Adriatic Sea; sustainability

1. Introduction

1.1. Background on the Topic

The transfer of knowledge from science and research to the general public (e.g., kids, schools, stakeholders, citizens) is an everyday challenge requiring specific communication

skills and methodologies [1]. In the field of environmental protection, it is a step of paramount importance to raise people's awareness about the role that everyone can have in environmental issues, considering their impact on our lives. Despite the Earth's large water coverage, we are not aware of the full extent of the environmental, medical, economic, social and political importance of the oceans and seas.

When the National Science Education Standards were published [2], members of the ocean sciences and ocean education communities realized that there was little mention of ocean topics in the content standards, and most state standards did not include oceans and/or coasts. This pushed educators to create innovative programmes to bring marine science content and experiences directly to students. Within this framework, in 2002, the "Ocean Literacy discussions" underlined the need to introduce an ocean science education [3]. Ocean literacy is defined as "an understanding of the ocean's influence on us and our influence on the ocean" [4]. Another useful concept in line with ocean literacy is ocean citizenship, which describes a relationship between our everyday lives and the health of the coastal and marine environment. Recently, the concept of ocean citizenship has been expanded to include environmental behaviour, and requires massive behavioural changes at the individual level [5]. Therefore, many projects and initiatives seek to raise awareness among citizens, with particular attention to young people, about the importance of maintaining clean and healthy oceans, protecting and conserving marine ecosystems and biodiversity, and considering the terrestrial and marine environment as closely interconnected [6]. However, in Italy and in many European countries, marine sciences are still not addressed in school curricula, which are generally focused on terrestrial natural sciences only [7]. The result is that citizens are often unaware of the ocean's importance and issues.

In line with this need, in recent years, the majority of national and international research projects started to include the "Communication and Dissemination" work package in their project structures, in which the applicant is required to define a communication strategy in line with the scientific work. In brief, this communication work package includes all actions, activities, events, tools and channels that are used to address different target groups that have to be identified *ex ante* to achieve the project aims and deliverables [8]. The choice of a communication strategy entails the selection and the organisation of different tools, instruments and media channels that should be differentiated by the target groups of stakeholders: policy or decision makers, the general public of adults or kids/youth, experts on specific topics, teachers, etc. [8]. A communication plan is one of the important instruments of the communication strategy that designs, guides and monitors, step-by-step, the efficacy of our communication actions and the spreading of the project messages. Moreover, both the strategy and the plan provide the project partners with key information that will be used to reach common goals in terms of dissemination and knowledge transfer [8]. The AdSWiM Project (Managed Use of Treated Urban Wastewater for the Quality of the Adriatic Sea) [9] and the WATERCARE project (Water Management Solutions For Reducing Microbial Environment Impact in Coastal Areas) [10] both have in common the attention to the quality of the ecosystems of the Adriatic Sea. These Interreg programmes, funded by the European Union [8], have always provided the best examples [11–14] and concrete actions for boosting the EU perspective in local policies. Interreg includes many programmes supporting cooperation across borders, and by many of these, we could be inspired by brilliant and concrete projects that involve schools at all levels and tackling disparate ecological issues strictly related to everyday life, e.g., [11–14].

AdSWiM and WATERCARE projects are part of the Programme Interreg Italy–Croatia, Axis 3—Environmental and Cultural Heritage. The specific objective of the projects is to improve the environmental quality conditions of the sea and coastal area by the use of sustainable and innovative technologies and approaches. Both projects that were active during the period 2019–2021 followed the communication strategy and plan designed by first investigating the target groups' identification and their involvement (Figure 1).

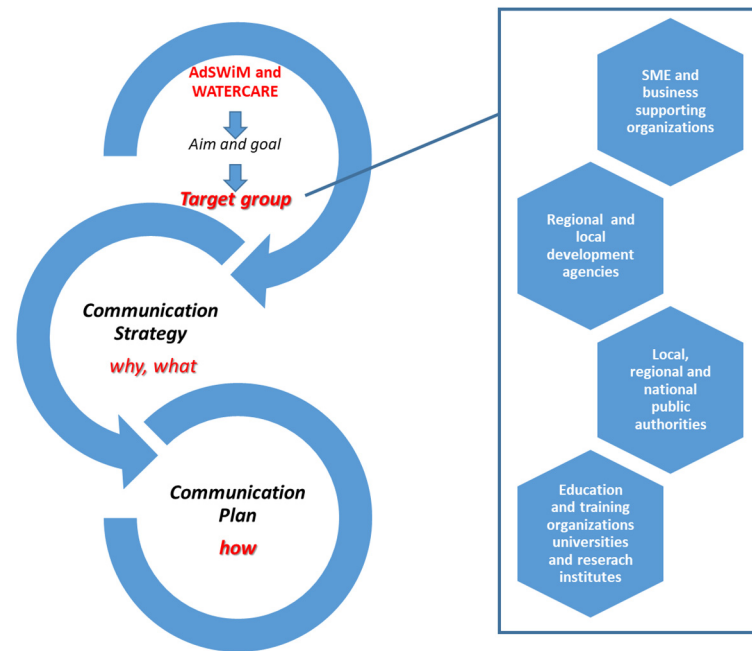


Figure 1. Scheme about the ad hoc methodology adopted by AdSWiM and WATERCARE projects for their communication activities.

Special attention was given to the last target group, identified as “education and training organizations”, with the objective of raising awareness among young people (i.e., students of different school grades) and teachers on targeted environmental topics and issues. Learning about respecting the environment and understanding how a local community can directly participate in improving the environmental suitability through lab work and practical engagement from an early age are fundamental if we want to capture the attention and readiness of the population and general public to cooperate [7]. Support to the initiatives promoted by AdSWiM and WATERCARE projects came from the national project Scuola2030 [15] that introduced in school curricula the development of the contents suggested by two of the 17 Sustainable Development Goals (SDGs) and the Agenda 2030 [16], namely:

Clean Water and Sanitation: Ensure the availability and sustainable management of water and sanitation for all.

Life Below Water: Conserve and sustainably use the oceans, seas and marine resources for sustainable development.

These SDGs advocate for reducing all kinds of marine pollution, as well as sustainably managing and protecting marine and coastal ecosystems. Consequently, our communication activities were in line with the main goals of the national Scuola2030 and fit well with the local and national education programmes.

The aim of this study was to present the ad hoc communication strategy and activities developed during the lifetime of AdSWiM and WATERCARE projects with schools and educational organisations. The general objectives of both project initiatives can be summarised as follows:

1. Teach different school grade students:
 - a. By offering them knowledge about effects of massive rains and floods on the quality of the Adriatic Sea; and
 - b. About the wastewater management processes and how the managed use of treated urban wastewater can contribute to the quality of the Adriatic Sea.
2. Stimulate the young public with good practice examples in order to demonstrate that sea contamination, wastewater and the sea water monitoring process can be dealt with at all education levels.

3. Stimulate the young public, teachers and families to think about everyday habits and water use: How do we affect water contamination? What is the effect of our habits on the sea environment? Can we self-regulate our habits to preserve and improve the status of our environment? These are some of the questions that were posed, and others arose during our activities highlighting the sensitivity to these themes.

The communication strategy was carried out on local and national levels, both in Italy and Croatia, co-ordinately.

1.2. The Problem to Be Reported to People

Almost 2.4 billion people live within 100 km of the ocean globally and they are strictly linked to the ocean on a regular basis (United Nations Ocean Conference, 2017). A significant proportion of all our resources originate from the oceans, and the sustainability of these supplies is intimately linked to decisions made by individuals and society. Everyday life decisions are taken by citizens, authorities and by all individuals in general from different social backgrounds and of different ages according to their being “ocean-literate” [17].

Coastal waters have long been recognised for their recreational and social value [18]. The western central Adriatic coast is a highly urbanised area. The increasing human activities along coastal areas, especially in surrounding semi-enclosed basins, such as the Adriatic Sea [19], make them ideal hotspots for many threats such as microbial pollution, eutrophication and urban and industrial wastewater discharges, producing strong environmental impacts along the coasts.

The results of this study are expected to function as a baseline to assess the success of the AdSWiM and WATERCARE communication strategy adopted with the public, spanning from students of primary, secondary and high schools up to students from universities. All the activities realised (e.g., seminars, didactic laboratories, guided tours) that involved young people sought to increase the awareness of the young public regarding the sea where they live (i.e., the Adriatic Sea), and also to serve as an approach to encourage new generations to have more responsible and informed behaviour toward the ocean and its resources.

2. Materials and Methods

2.1. AdSWiM Project Activities with Schools and Teachers

All the work carried out in the AdSWiM project in relation to the communication activities and to the educational didactic module for teachers and pupils followed the communication strategy setup and the main communication visual identity that was developed at the project start and shared with all the project partners.

The office pack, event kit, press kit, visitor programme kit, lab and workshop kit, season greetings digital postcards, flyers, roll-ups, partners’ customised leaflets and posters, technical abstracts, 11 types of gadgets and a final brochure were all prepared in three languages, adopting the programme’s official visuals, colours, the AdSWiM logo and campaign graphics. Moreover, one of the threats to the efficiency of dissemination was identified in the topics of the project and outcomes that might have seemed too complex to be understood by all target groups, particularly by the general public and youth. In response, one single shared visual identity for the project was created, based around simple but strong elements (Figure 2).

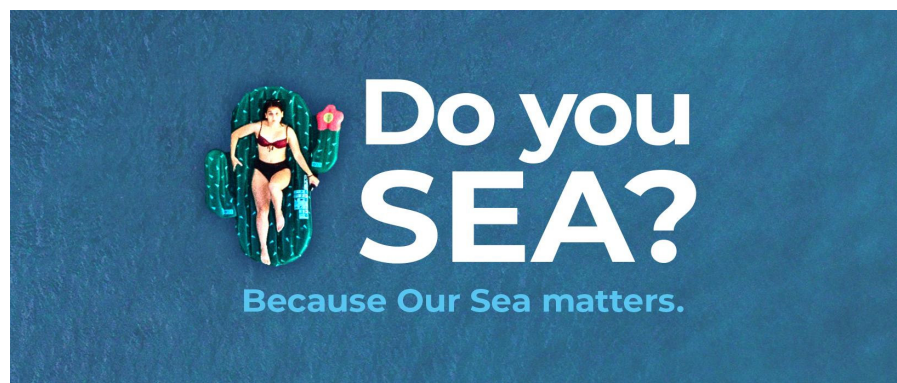


Figure 2. Visual identity of the AdSWiM project.

Furthermore, the awareness campaign was set up to support three categories of information and educational activities that were scheduled around the 15 international days related to the environment and nature, water and sea topics, health and scientific research with a focus on Agenda 2030, Natura 2000 sites and horizontal principles of sustainable development. All the events created during the project lifetime were based on this one shared, scheduled calendar. Moreover, all communication kits and leaflets or flyers were personalised for each partner.

Many of the events proposed on the local level included the realisation of didactic laboratories that involved different targets—students, citizens (in particular, families with children) and the general public—and consisted of several didactic activities focused on the wastewater treatment plant process and water cycle. How does a depuration plant work? Where is the pollution coming from? What are pollutants? Are we responsible for this pollution? Can we act to reduce pollution? Where are these pollutants spread? These questions were some of the questions used to stimulate curiosity and awareness. All the information to perform these activities was passed through customised leaflets of instructions respecting our visual identity. A lab and workshop kit for kids was created consisting of 7 personalised lab leaflets and gadgets in collaboration with partners—institutions (UNIUD, UNIVPM, METRIS, IHZ), water companies (CAFC, VIK and IZVOR PLOČE) and municipalities (Udine, Pescara). Workshops and events were also organised, and for each occasion, a communication kit was prepared, still adopting the visual identity of the project. A total of eight cities, located both in Italy and Croatia, were involved in different communication activities with students: Fano, Udine, Senigallia, Ancona and Pescara on the Italian side; Pula, Zadar and Jadran on the Croatian side.

In 2020, for the first time, a didactic module created based on the “take action” concept was addressed to teachers and to the pupils of primary schools, focusing on the promotion of seawater and coastline protection issues and wastewater management education. The first part of the module focused on a training programme for teachers based on 8 different lessons. These were to take place in person and on-site, but due to the lockdown, the entire training course was offered online. It took place from January until June 2021, and the final meeting was held on 8 June to celebrate World Oceans Day to develop systematic skills based on brainstorming and cooperative learning approaches that could be used and proposed permanently during classroom lessons. The module received patronage from the University of Udine and PROESOF 2020.

To engage local schools (elementary or secondary schools), guided visits to relevant locations related to AdSWiM project work (depuration plants, treated wastewater discharge points spot, seaside coastal areas) were organised for citizens and experts. The aim of all activities was based on the concepts of “call to action” and “take action”, which were the rationale of the AdSWiM communication campaign. From a practical point of view, to have the target groups mentioned in Figure 1 convey our message of awareness, public releases, editorials and scientific manuscripts, social media and videos (i.e., one of the project deliverables was also the realisation of two video infographics) were used together with the

participation and the organisation of national and international events or congresses. All these initiatives happened mainly online due to the limitations introduced by the COVID-19 pandemic; however, we were able to perform some of the events in person. All the people involved in the workshops and guided visits became promoters of the project on social media and on a face-to-face level.

2.2. WATERCARE Project Communication Strategy with Schools and Teachers

The WATERCARE communication strategy was created in order to define a framework and set of measures and actions to promote the project outputs and results; the identification of local, regional, national and EU communication channels; target groups; goals and focuses; and obligations. The main beneficiaries of the project were public authorities, coastal zone managers and stakeholders, i.e., operators of facilities and tourist services, swimmers and bathers, tourists, citizens, high schools and universities. The communication strategy was created to reach different target groups, increase their knowledge about the project objectives, stimulate them to perform activities and change their attitudes. The key idea was to influence target groups to make some changes. Students of high schools and universities represented one of the target groups, and the goal was to offer them knowledge about the effect of massive rains and floods on the quality of the sea, and also show them good practice examples and teach them that the contamination of the sea via natural causes can be dealt with. By making students a part of the project activities via media, social networks and concrete activities, the project aim was to show them that they can contribute to cleaner seas by using their resources and actions. For WATERCARE dissemination activities with students, different cities located on the Adriatic Sea in Italy and Croatia were selected to cover a fair geographic area. In Italy, five cities were involved in the programme: Bologna, Urbino, Fano, Ancona and Porto S. Elpidio. In Croatia, the activities took place in Split, Pula, Zagreb and Rijeka. Identified target groups were reached through different tactics:

- Realisation of a media campaign. This campaign used both traditional communication channels and media, such as press agencies, newspapers, magazines and TV, and digital communication channels through social media, namely, WATERCARE's Facebook page, project partners' institutional websites and the web platforms of the project and IT-HR.
- Presentation of WATERCARE's main aim and results to students from Italian and Croatian universities and to high school students through seminars and conferences. During conferences, leaflets in English, Italian and Croatian were distributed to explain the positive influence of the WATERCARE project and the main expected project outputs.
- Distribution of four editions of a regular digital newsletter project in English, Italian and Croatian was carried out to have a further impact on target groups.
- Distribution of project gadgets during public events as an effective strategy for the project goals' advertising and for the durability of the project's messages to the public.

An evaluation of WATERCARE's communication and dissemination strategy was performed through a frequent monitoring of the actions and tools. This was important to realise what actions needed to be improved or dismissed and which activities were successful.

3. Results

The activities and initiatives realised during the duration of the two projects are reported in Tables S1 and S2.

3.1. AdSWiM Communication Activities and Outputs

For the AdSWiM project, the "communication activities" package was organised in two principal communication engagements: the first regarded the strategic organisation of tools and the production and dissemination of promotional project materials, and the second was related to the synergic planned awareness education and training initiatives

that were held by the Italian and Croatian partners over the project's lifespan with the aim of promoting project objectives and challenges.

The results of this project can be summarised as about 135 articles published in local, regional and national newspapers; magazines (Italian 50%, Croatian 38%, others 12%); and four radio interviews and two TV editorials, reaching almost 7 million users/readers. Still, to gain the attention of the general public and stakeholders, more than 20 bilingual official press releases were produced and 12 editorial articles were written. Apart from English as the official language of the programme, Croatian and Italian were both used to better disseminate information relevant to the project activities. Specific populations were also engaged by 15 scientific articles published in the relevant area of research (i.e., sensors and biosensors development, chemical and microbiological monitoring, water management). Project social media channels (three Facebook channels, Twitter, YouTube, LinkedIn) and one project website were embedded with information and results. Three testimonials from a woman (Figure 2), a man and two kids (Figure S1), all laying on a cactus-shaped pool toy mattress, accompanied all project activities over all three years of the project lifetime as a visual identity.

Thanks to a synergic awareness education and training initiative programme, AdSWiM partners hosted and/or participated in 110 events in person, online and in blended editions. Most of the events were technical workshops or conventions or scientific meetings or technical conferences and fairs. Some of the events involved the general public and students, held in person and online due to COVID-19 restrictions. Several joint meetings were organised with other Interreg Italy–Croatia projects or other EU projects on overlapping issues in order to strengthen cooperation between public administrations, scientific and research institutions and water managers. All the events were organised cross-border, or partners were invited to take part in them.

The AdSWiM didactic module involved several Italian and Croatian partners, 51 teachers and almost 600 primary school pupils from all regions (Friuli Venezia Giulia Region, Marche and Abruzzo Region, Istrian County, Dubrovnik-Neretva County and Split-Dalmatia county).

The structure of the module was in two sections; the classes worked on the proposed topics in order to create a joint work with the teachers to put in place the knowledge obtained during the first part of the training course, during which some teachers presented the work carried out in classes on the project topics by using an infographic as a teaching method with pupils. The proposed topics were treated with a methodological approach to inform and offer teachers intervention strategies to effectively transfer content to pupils as well as ideas for practical activities together with suggestions for evaluating the newly acquired knowledge. The second part of the didactic module involved pupils of the primary schools and focused on wastewater management education, awareness and environmental protection themes. The closing event of the didactic module was organised on 8 June to celebrate World Oceans Day. The event and lessons were recorded. AdSWiM certificates of participation in two graphic formats were produced and distributed to teachers, pupils and classes for their participation (Figures S2 and S3). The Italian teachers could also apply for "S.O.F.I.A" accreditation, as the module was approved by the Italian Ministry of Education [20].

Twelve laboratories for kids were held in person at museums, local schools and summer camps in Fano, Senigallia, Udine, Pula and Zadar and online from Pescara and Ancona. Four kids' corners were created in digital format and promoted through the project's social media and website. During most of the educational labs and workshops, the participants learned how to create miniature water purifiers (Figures 3, S4 and S5) by using a series of filters made of everyday materials and observed how the dirty water that passes through different layers became purified.

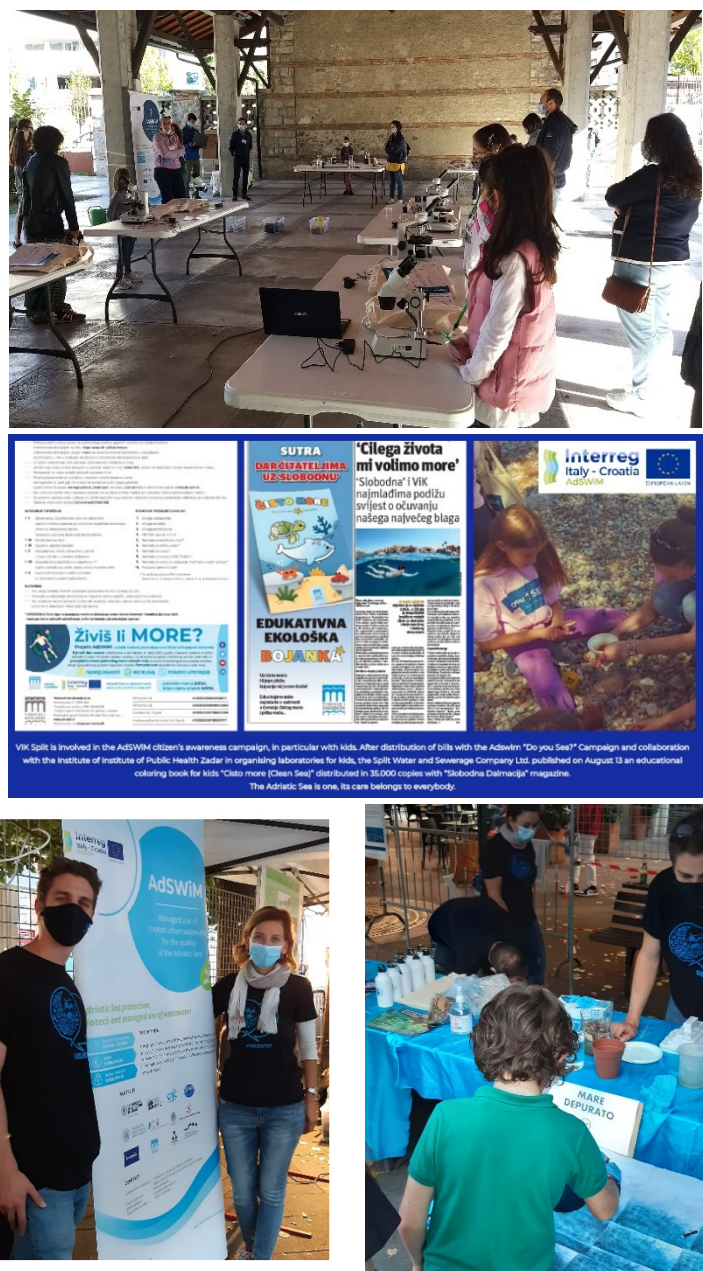


Figure 3. Educational labs and event and booklet for kids' activities.

During the three-year project, 12 in-person guided study visits and open door events for schools, citizens and experts were organised together with three virtual ones. A 12-min video was also produced that presents a detailed guided visit to the purification plant in Stupe Split, uploaded to the AdSWiM YouTube channel. The visitor programme kit consisted of four personalised visit leaflets and promotional items in collaboration with the water and sewage management partners and territorial companies involved (CAFC S.p.A, ACA PESCARA, ASET FANO, VIK Split and IZVOR PLOČE). In addition to this, professional videos (see Table 1) were created connected to the project activities. These enriched the already delivered infographic videos—the first one prepared at the beginning of the project presented the partnership with a call to action of good practices for citizens, and the second one at the end of the project presented the project results and technological innovations that can improve the water status of the sea. Both videos were used during the activities and are available on the project's YouTube channel (Table 1).

Table 1. Communication strategy plans adopted for AdSWiM and WATERCARE projects.

<i>TARGET with Indicator of Measurement and Characteristics</i>	<i>Communication Objectives</i>
Education and training organisations: awareness Universities: increase knowledge Primary and High Schools: practice	Improve awareness and knowledge at different level of education about: Sustainability Resource conservation Biodiversity Water protection Discharge of polluted waters into the sea and effects on coastal areas and bathing
<i>Communication Channels and Tools</i>	
AdSWiM Project and partner websites Videos of project objectives and results: [22] Social media campaigns and regular updating (Facebook, Twitter, LinkedIn, YouTube) [24] Tailored publication in specific magazines, newspapers, TV and radio programmes (showcase of results and call to action to the public). Didactic module, school labs, guided visits and open door programme for visits for schools with communication kits and gadgets. Microscope donations to a local school in Udine. Conferences, workshops and study visits at schools, universities, administrative stakeholders and knowledge transmitters.	WATERCARE Project and partner websites Drawing project with high school of art Nolfi-Apolloni (Fano): [21] Video of project objectives and results: [23] Social media campaigns and regular updating (Facebook and YouTube). Tailored publication in specific magazines, newspapers, TV and radio programmes (showcase of results and call to action to the public). Conferences, workshops and study visits at schools, universities, stakeholders and knowledge transmitters.

The project entered the shortlist of the top 10 best European projects for the SLAM Interreg competition in the 2020 Youth Section [25]. The project also became a good practice and the only project of the Italy–Croatia 2014–2020 Programme presented at “Comunicare Interreg”, an event organised by the Italian Agency for Territorial Cohesion and the Puglia Region, in line with “Europe closer to citizens” and activities that protect and improve the urban environment and educate and inform citizens in order to achieve local and global sustainability [26].

3.2. WATERCARE Communication Activities and Outputs

During the lifetime of the WATERCARE project, a total of six public events were organised (50% in Italy and 50% in Croatia); moreover, four newsletters and five ad hoc videos (three videos and two live stream videos) were produced and shared with a wide public. A total of 91 media publications in specialised press channels, web portals and newspapers have been issued, along with four press conferences. The Facebook page dedicated to the project received 22,792 views and 1989 clicks on posts.

In particular, the communication activities that focused on students as a target group (i.e., high schools and universities) were mainly based on seminars in person when possible and online due to COVID-19 restrictions. Despite the pandemic requiring an in-depth revision of the communication plan, many activities have been carried out to raise awareness among students about microbial pollution of bathing waters, environmental quality and risk assessment. A series of seminars was conducted, involving Italian and Croatian high schools and universities (Table S2; Figure 4), during which the WATERCARE project was introduced to the students and the sampling activities were shown together with the central

unit, sensors and automatic samplers. Preliminary results were illustrated for microbial loads, chemical–physical parameters and a forecast model. Seminars and lectures were given by various experts in order to present the problem and the novelty of the solutions proposed by WATERCARE from different perspectives. When possible, students were involved in sampling and laboratory activities to put into practice what they learned with theory (Table S2).

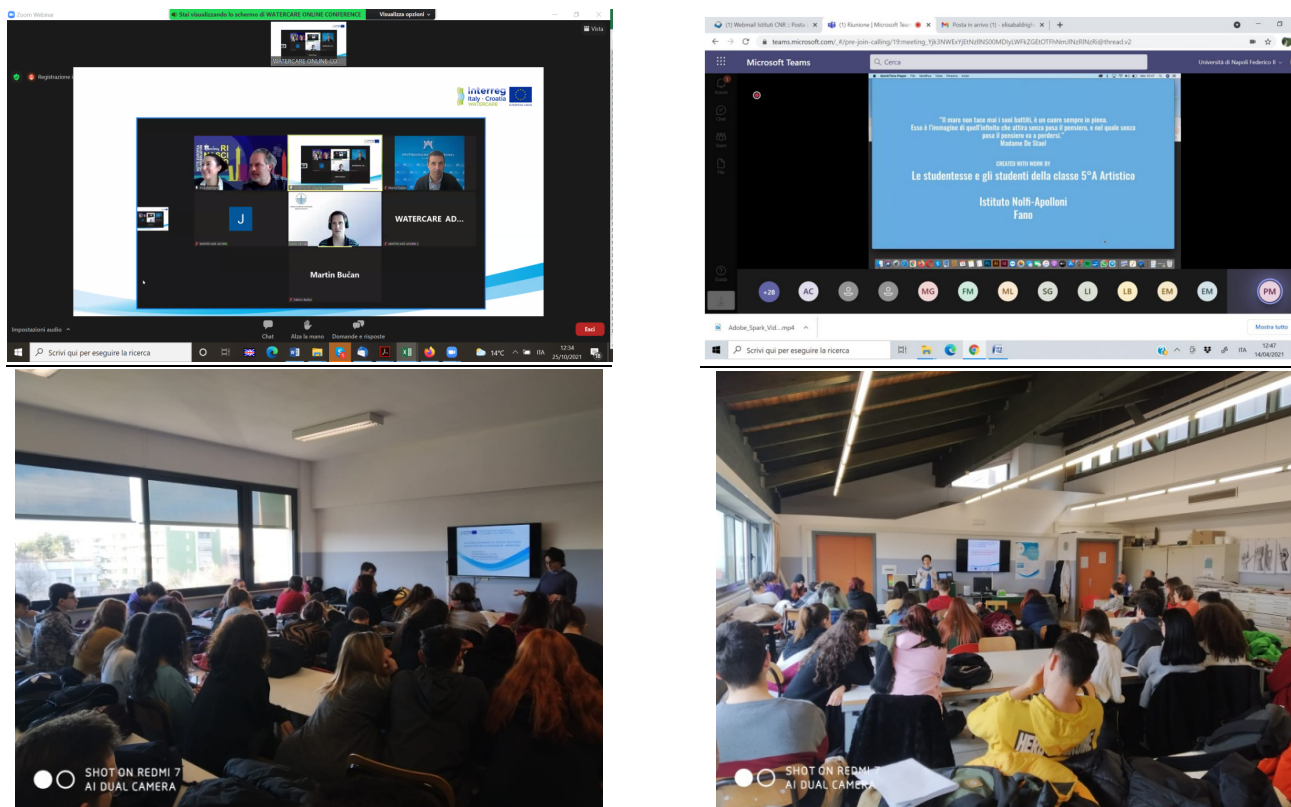


Figure 4. Online seminars with students from Italian and Croatian Universities (**top left**); online “Info-day” with the awarding of the best drawing (**top right**); seminars in person at Nolfi-Apolloni high school (**bottom**).

With the “Art & Science” project, in which the Nolfi-Apolloni high school of art in Fano was actively involved, WATERCARE was introduced through a double approach:

- To inform and attract the interest of the students meeting with two seminars, during which the main aim and the objectives of the project and the delicate ecological issue of environmental quality and risks due to bacterial contamination of coastal waters were presented.
- To stimulate students with a challenge dealing with the decoration of the small cabin at the mouth of the Arzilla River, to keep the sampling instruments and make it more attractive for the public. Decorations were based on marine themes and up to the imagination of the students.

The “Art & Science” project was fully presented during the “Info-day” event in April 2021. Since the beginning of the WATERCARE project, students have been involved in drawings with themes related to the sea and to the WATERCARE project. For the “Info-day” event, they showed the public drawings for the cabin decoration in Fano, and the best design was voted for by the audience. The winner will be the cover of this Special Issue (Figure S6); all the drawings are presented as Supplementary Material (Figures S5 and S6). The “Art & Science” project successfully ended with the inauguration of the panels for the cabin in June 2021 (Table S2; Figure 5). During that event, students explained their work and how they chose the decorations. Another output from “Art & Science” was a

high-quality and meaningful video made by the students who took part in this project (see Table 1).



Figure 5. Inauguration of the panels for the cabin at Arzilla River (Fano, 26 June 2021) with students and teacher (**left**) and a detail of the cabin (**right**).

4. Discussion

4.1. Raising Public Awareness

The role of environmental education in generating critically thinking citizens is a topic that gained traction and manifested in the 2030 Agenda. Communication and dissemination strategies are considered as pillars of Interreg projects. Communication strategies can be defined as any educational, cultural or scientific activity that “extends” academic and research practices and knowledge to the surrounding community and especially children [27].

This study is intended to be the presentation and sharing with the scientific community of a pilot approach in the communication strategy addressed to Italian and Croatian students. The pioneering aspect of this work is the promising but complex theme of microbial pollution and bathing water management (topics of the projects) around which we raise awareness among a young audience consisting of people of different ages. Differently from other more attractive issues, such as plastic pollution [28], marine flora and fauna [29] and/or ocean literacy and the Mediterranean Sea [1], coastal water pollution could appear less “exciting”.

The Interreg projects AdSWiM and WATERCARE developed communication strategies for a wide public, with special efforts for kids and students of different ages. The common objective was to promote awareness and encourage responsible behaviour towards the environment, particularly water and marine habitats and ecosystems. The challenge they dealt with was making the topics of the projects understandable by the target groups (e.g., students). Communication strategies from both projects were clearly defined and differentiated according to the target groups: (i) lessons, activities, didactic laboratories and training courses for teachers and primary school children on the one hand (i.e., AdSWiM); (ii) lessons, seminars and artistic productions with the “Art & Science” project for students from high schools and universities (i.e., WATERCARE).

All activities were designed and realised in order to explain/introduce the ecological issue (i.e., seminars, lessons, promotional project materials, guided tours), to “touch” the problem (i.e., laboratory and sampling activities) and to elaborate and make the issue their own (i.e., “Art & Science” project). Laboratory activities, sampling activities and the “Art & Science” initiative constituted pivotal steps, obliging students to evolve from a passive public into an active public aware of the ecological problem (e.g., [1]).

Unfortunately, at the beginning of 2020, the COVID-19 pandemic forced a review of most activities planned in the communication strategies. For both projects, the communication strategies were updated to reschedule some activities and to boost new ones to reach the target groups and not to lose sight of the objective. In-person lessons, laboratories and guided tours were converted to online versions. These forced changes made contexts more

accessible on one hand, but on the other hand, erased direct “contact” with the issue and made the topics more abstract.

4.2. Have We Implemented a Successful Strategy?

A strategy can be defined as a successful one if the goal(s) have been reached. In the case of a communication strategy, the number of target groups reached is a yardstick, but a number is not a comprehensive way to define the level of success we obtained. A better way seems to be the evaluation of the impact of the call to action messages and if they reached the target groups. Furthermore, the impact of our messages will determine the durability of the message and the implementation of good actions and practices. However, in these days, some of the schools involved were already asking for some of the activities offered. Specific projects and programmes interested in communication were inviting to describe the strategy and the results gained. The lockdown did not make things easier, particularly for kids and students, and made it a true challenge to carry out communication activities. For several months, computer screens and mobile phones were the main vehicles of learning, and with communication and virtual interaction channels, AdSWiM developed a dedicated strategy for pupils of primary schools based on touching the problem with one’s own hands through practical laboratories. The aim was to demonstrate in a simple but effective way what happens during the treatment process of the “dirty” water we produce in our daily lives and to question the water circuit. This stimulated the creativity of pupils who reacted enthusiastically: they understood the problem and they created the solution, e.g., maps, graphs, booklets, etc., to suggest how to protect the marine environment and how to reduce the anthropic impact. During the strict lockdown period, many activities were converted to online activities and lessons for teachers, too. This helped keep the pupils active and focused on the subject matter and helped teachers transfer content to pupils. It also helped the project reach greater numbers of classes and pupils involved in our activities and carry out more targeted activities.

WATERCARE dedicated particular attention to students from high schools and universities as an important target group to reach with communication activities. Many initiatives were converted into online seminars and lessons. Students’ attention and participation were kept active with open debates based on questions and answers with experts, professors and researchers.

The most successful initiative was the “Art & Science” project. The introductory lessons on the subject were all held in person, and in this case, the students were asked to rework the ecological theme through art. Students did not create only the drawings for the cabin, they also produced a video explaining how they created their works and the meaning of what they created. The result was an in-depth interpretation of the ecological issue (i.e., microbial pollution of bathing waters) and their internalisation of the problem with a clear take-home message for the public. This project allowed the students to remain active even at a distance by achieving a common goal.

To protect, preserve and sustainably use marine resources, citizens of all ages need to know and understand the connection between man and sea, i.e., to be ocean-literate citizens. Beyond understanding, an ocean-literate citizen uses ocean knowledge and awareness of ocean issues to communicate about the ocean in a meaningful way and make informed and responsible decisions [7]. The promotion of ocean literacy among students is crucial, as children and young people represent the future citizens and consumers who will develop attitudes and make decisions that will inevitably affect the environment. Children are also important agents of social change in society, because apart from performing responsible environmental behaviours themselves directly, they also have the potential to bring about change by influencing the environmental knowledge, attitudes and behaviours of peers, family and the wider community [30]. To this aim, Interreg projects such as AdSWiM and WATERCARE can be taken as examples of communication strategies devoted to promoting ocean literacy among youth and as a valuable attempt to continue to expand the still-limited and inadequate knowledge about our oceans [31].

5. Conclusions

Factors that may affect levels of knowledge are awareness, attitude, communication, behaviour and activism [32]. Overall, the response–reaction we observed from the young public was promising. Kids and students appeared particularly interested when practical actions that required imagination were associated with theory. In this paper, we present early results that cannot be generalised, mainly due to the limited number of kids and students and to the restricted geographical area involved. However, our results point out the need for further communication and educational actions on less “charismatic” but equally important ecological topics related to the marine environment. Our results are anticipating the EU policy of the Green New Deal, which is asking for the involvement of citizens. The repetition of similar interventions followed by surveys with a larger number of participants from different countries is recommended, taking advantage of international projects such as Interreg. We would like to suggest further efforts to provide tools and approaches to transform knowledge into behaviour change and actions, and in this way, to promote the sustainable use of our oceans.

Supplementary Materials: The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/w14121843/s1>, Figure S1: “Do you Sea? Because our Sea Matters” campaign; Figure S2: Examples of the templates for certificates of attendance of the AdSWiM project educational module and the workshops organised for teachers, classes and pupils; Figure S3: Examples of the workshop kits and tools invented, bought and created for the labs; Figure S4: Educational activities and workshops for citizens, children and families (Rome, Fano and Udine, 2019–2021); Figure S5: Drawing by the students from Nolfi-Apolloni high school in Fano; Figure S6: The winning drawing of the competition. Table S1: AdSWiM communication activities—summary of obtained results and achieved target groups; Table S2: WATERCARE communication activities—summary of obtained results and achieved target groups.

Author Contributions: Conceptualisation, E.B., P.M. and S.S.; methodology, E.B., P.M. and S.S.; resources, M.K., E.E.R., I.K., S.S. and M.M.; data curation, E.B., P.M. and S.S.; writing—original draft preparation, E.B., P.M. and S.S.; E.B., P.M., S.S., A.A., A.P., E.M., E.R., F.G., G.G., I.D., M.O., P.P., V.S., M.B. and J.B. writing—review and editing; funding acquisition, S.S. and M.M. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the WATERCARE project (Water Management Solutions for Reducing Microbial Environment Impact in Coastal Areas, project ID 10044130, <https://www.italycroatia.eu/web/watercare>, accessed on 4 March 2022) funded by the European Union under the Interreg Italy–Croatia CBC Programme. This research was funded by the AdSWiM project (Managed Use of Wastewater for the Quality of the Adriatic Sea, project ID 10044146, <https://www.italycroatia.eu/web/adswim>, accessed on 4 March 2022) funded by the European Union under the Interreg Italy–Croatia VA CBC Programme 2014–2020.

Acknowledgments: AdSWiM thanks all the partnership and the experts engaged in the activities of communication and the IT-HR cross-border school, teachers and depuration plants who allowed their realisation. WATERCARE authors wish to thank all the experts, researchers, students and professors involved in the communication activities. Special thanks to the Nolfi-Apolloni students of class 5A and to Paola Mancini, Silvia Mazzacuva and Samuele Giombi who made the “Art & Science” project possible.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Koulouri, P.; Mogias, A.; Gerovasileiou, V. Ocean Literacy across the Mediterranean Sea region in the Era of 2030 Agenda and the Decade of Ocean Science for Sustainable Development (2021–2030). *Mediterr. Mar. Sci.* **2022**, *23*, 266–269. [CrossRef]
2. National Research Council. *National Science Education Standards*; National Academy Press: Washington, DC, USA, 1996.
3. Schoedinger, S.; Tran, L.U.; Whitley, L. From the principles to the scope and sequence: A brief history of the ocean literacy campaign. *NMEA Spec. Rep.* **2010**, *3*, 3–7.
4. Payne, D.L.; Marrero, M.E.; Schoedinger, S.E.; Halversen, C. The Rise and Fall of the Tide: Ocean Literacy in the United States. *Mediterr. Mar. Sci.* **2022**, *23*, 270–276. [CrossRef]

5. Santoro, F.; Mokos, M.; Cheimonopoulou, M.; Realdon, G.; Koulouri, P.; Papathanassiou, M. Mediterranean sea literacy: Adapting ocean literacy principles to the mediterranean region. In Proceedings of the EMSEA 2017 Conference Book of Abstracts, Valletta, Malta, 7–10 October 2017.
6. Sullivan, J.; Croisant, S.; Howarth, M.; Subra, W.; Orr, M.; Elferink, C. Implications of the GC-HARMS Fishermen’s Citizen Science Network: Issues Raised 2017, Lessons Learned, and Next Steps for the Network and Citizen Science. *New Solut. J. Environ. Occup. Health Policy* **2019**, *28*, 570–598. [CrossRef] [PubMed]
7. Mogias, A.; Boubonari, T.; Realdon, G.; Previati, M.; Mokos, M.; Koulouri, P.; Cheimonopoulou, M.T. Evaluating Ocean Literacy of Elementary School Students: Preliminary Results of a Cross-Cultural Study in the Mediterranean Region. *Front. Mar. Sci.* **2019**, *6*, 396. [CrossRef]
8. Interreg. Homepage. Available online: <https://interreg.eu/> (accessed on 22 February 2022).
9. Interreg. Managed Use of Treated Urban Wastewater for the Quality of the Adriatic Sea. Available online: www.italy-croatia.eu/adswim (accessed on 22 February 2022).
10. Interreg. Water Management Solutions for Reducing Microbial Environment Impact in Coastal Areas. Available online: www.italy-croatia.eu/watercare (accessed on 22 February 2022).
11. Interreg. Improving Energy Efficiency in Schools. Available online: <https://bit.ly/3wGb0sV> (accessed on 22 February 2022).
12. Interreg. Engaging Schools on Light Pollution. Available online: <https://bit.ly/3lFs2kz> (accessed on 22 February 2022).
13. Interreg. Available online: <https://www.interregeurope.eu/schoolchance> (accessed on 20 January 2022).
14. Interreg. Available online: <https://www.italy-croatia.eu/-/asoc-etc-at-school-of-open-cohesion> (accessed on 20 January 2022).
15. INDIRE. Scuola 2030. Available online: <https://scuola2030.indire.it> (accessed on 20 January 2022).
16. United Nations. 17 Goals to Transform Our World. Available online: <https://www.un.org/sustainabledevelopment> (accessed on 20 January 2022).
17. Fielding, S.; Copley, J.T.; Mills, R.A. Exploring Our Oceans: Using the Global Classroom to Develop Ocean Literacy. *Front. Mar. Sci.* **2019**, *6*, 340. [CrossRef]
18. Bedri, Z.; Corkery, A.; O’Sullivan, J.J.; Deering, L.A.; Demeter, K.; Meijer, W.G.; O’Hare, G.; Masterson, B. Evaluating a microbial water quality prediction model for beach management under the revised EU Bathing Water Directive. *J. Environ. Manag.* **2016**, *167*, 49–58. [CrossRef] [PubMed]
19. Marini, M.; Jones, B.H.; Campanelli, A.; Grilli, F.; Lee, C.M. Seasonal variability and Po River plume influence on biochemical properties along western Adriatic coast. *J. Geophys. Res. Earth Surf.* **2008**, *113*, C05S90. [CrossRef]
20. Ministero dell’Istruzione. Formazione Docenti, on Line la Piattaforma Digitale S.O.F.I.A. Available online: <https://bit.ly/3sSTgII> (accessed on 12 January 2022).
21. Interreg. Nolfi-Apolloni ‘Art & Science’ Video for WATERCARE Project. Available online: <https://bit.ly/3lKtkuN> (accessed on 12 January 2022).
22. Interreg. Videos of the Project AdSwim. Available online: <https://bit.ly/38h1KCh>; <https://bit.ly/3GhVrec>; <https://bit.ly/3anoj92> (accessed on 12 January 2022).
23. Interreg. Videos of the Project WATERCARE. Available online: <https://bit.ly/3GI3o2s>; <https://bit.ly/3yY47Vy>; <https://bit.ly/39UJFKs> (accessed on 12 January 2022).
24. Interreg. Social Media Campaigns of the Project AdSwim. Available online: <https://bit.ly/3yYuiLD> (accessed on 12 January 2022).
25. Interreg. Interreg Project Slam 2021: Call for Stories. Available online: <https://bit.ly/3GfvYlu> (accessed on 20 February 2022).
26. Interreg. Seminario Online, 6 Maggio 2021. Available online: <https://bit.ly/3wUghfA> (accessed on 20 February 2022).
27. Stefanelli-Silva, G.; Pardo, J.C.F.; Paixão, P.; Costa, T.M. University Extension and Informal Education: Useful Tools for Bottom-Up Ocean and Coastal Literacy of Primary School Children in Brazil. *Front. Mar. Sci.* **2019**, *6*, 389. [CrossRef]
28. Andriopoulou, A.; Giakoumi, S.; Kouvarda, T.; Tsabaris, C.; Pavlatou, E.; Scoullou, M. Digital storytelling as an educational tool for scientific, environmental and sustainable development literacy on marine litter in informal education environments (Case study: Hellenic Center for Marine Research). *Mediterr. Mar. Sci.* **2022**, *23*, 327–337. [CrossRef]
29. Mioni, E. “Percorsi nel Blu” (“Blue Paths”): A long-lasting project to integrate Ocean Literacy and Marine Citizen Science into school curricula. *Mediterr. Mar. Sci.* **2022**, *23*, 405–416. [CrossRef]
30. Hartley, B.; Thompson, R.C.; Pahl, S. Marine litter education boosts children’s understanding and self-reported actions. *Mar. Pollut. Bull.* **2015**, *90*, 209–217. [CrossRef] [PubMed]
31. Mogias, A.; Boubonari, T.; Markos, A.; Kevrekidis, T. Greek preservice teachers’ knowledge of ocean sciences issues and attitudes toward ocean stewardship. *J. Environ. Educ.* **2015**, *46*, 251–270. [CrossRef]
32. Paredes-Coral, E.; Deprez, T.; Mokos, M.; Vanreusel, A.; Roose, H. The Blue Survey: Validation of an instrument to measure ocean literacy among adults. *Mediterr. Mar. Sci.* **2022**, *23*, 321–326. [CrossRef]