

# Narrative role playing – a science multiplication tool- at the AWI school lab OPENSEA on Helgoland



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**Abstract** Over the last decades there has been an increasing awareness within the scientific community concerning the importance of communicating science. To date, there are multiple citizen science programs aimed at facilitating the sharing of scientific knowledge with the public. One approach adopts narrative role plays, involving interactive games which simulate real-life situations in a safe environment. During these simulations, participants adopt different roles or interest groups (scientist, politician) and are posed with a specific research question relevant to current topics e.g. environmental protection.

In this study the AWI school lab OPENSEA developed a narrative role play surrounding the theme of marine litter and the plastic dilemma.

## Narrative role playing – The Plastic Dilemma

Marine litter, in view of political interest, is an ethical dilemma offering no easy or obvious solution. In the form of a microcosm, the narrative role play of the AWI school lab OPENSEA simulates a municipal-political debate for high school students. The students are divided in five different interest groups: politicians, representatives of the plastics industry, conservationists/ environmentalists, scientists, and citizens of the fictional city of "Siebenstadt". Each interest group has three to six members with different roles and role-specific points of view.

The students learn about the different perspectives of plastic pollution during the exercise, through hands-on research and discovery. We apply recent scientific findings and literature, as well as interactive modules designed to take place both in the field and in the lab. The modules are designed to also be applicable in a classroom settings for the implementation of 'education for sustainable development'.

### The Five Phases

In the **first phase**, 'introduction and role finding', the role playing science multiplication tool is presented and the roles assigned to the students. The interest groups get time to reflect on their role and to gather further ideas for their assigned position.

In the **second phase**, 'work and reading phase', the students collect information and try to develop important arguments that strengthen their role. The groups work independently on different learning modules and explore "Siebenstadt".

In the **third phase**, 'interaction phase', the students write a short interim report, which forms their collective position moving into the next phase. Afterwards, the students have the opportunity to fill knowledge gaps and formulate coherent arguments.

In the **fourth phase**, 'discussion phase', all the separate interest groups take part in a debate. Each interest group presents their argument, and their statements will be discussed. The politicians interest group then announces their decision for the benefit of the city.

In the **final phase**, 'evaluation phase', the experiences are reflected upon and the students get the opportunity to give feedback and to ask questions. Solutions and ideas for dealing with plastic in their schools are discussed.



## Learning Modules

For the narrative role playing game, eight learning modules were developed. In the second phase of the game each interest group works on four learning modules. Each learning module contains background knowledge, an experiment or a research question, and a specific task for the individual interest groups. Each learning module is completed by at least two groups to verify the results.

- **Political decisions:** Examples from other European cities and countries and political decisions in Germany should help students to get ideas for dealing with plastics.
- **Garbage Monitoring:** Students learn what materials litter is composed from and develop solutions for waste management.
- **Properties of plastic:** In experiments, the chemical properties of plastics are explored independently by the students. Advantages and disadvantages of plastic use are examined.
- **Plastic in the water:** The students use flow tests to investigate how plastic behaves in different water bodies, such as rivers and oceans.
- **Plastic in everyday life:** The students are confronted with their own plastic consumption. They track how much plastic they use personally each day.
- **Plastic from clothing:** The students examine the loss of plastic fibers from clothing during washing, and reflect upon where it may end up.
- **Microplastics:** Students learn about the formation of microplastics and their distribution in the riverine and marine environment.
- **Solving the plastic problem:** The students become engaged creatively themselves and consider potential solutions for the reduction of plastic use in society.

## Interest Groups

During the narrative role playing game, the students assume roles in five different interest groups. They keep their roles throughout the entire game. Each group examines a specific aspect of plastic pollution.

- **Politicians:** They have a unique role, as they are responsible for the final decision. They want to strengthen "Siebenstadt" and make it more attractive for its citizens.
- **Representatives of the plastics industry:** They see the advantages of plastic. For them, their focus is on the benefits of plastic use and the advantages it can offer humanity. They won't see the total elimination of plastic use as a solution, due to their vested interest.
- **Scientists:** They understand the complexities of the problem of environmental plastic, as well as the advantages that plastic brings into our everyday lives. They try to find a workable compromise.
- **Nature- / Environmentalists:** Their aim is to have a plastic-free "Siebenstadt". They protect the city and its natural places. Plastic use is a huge problem for them and they want to stop it at its source.
- **Citizens:** They are aware of everyday plastic use, and know about the problems it generates from the media. They have individualistic views but in the end want what is best for them and their city.

