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Towards a post-humanist design for educational inclusion: Proposing a study pedagogy for litter polluted critical zones

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Abstract

In this contribution to the special issue on adult education, inclusion and justice we discuss how an inclusive pedagogy can foster a more just way of inhabiting litter polluted living environments, in which the interests of both human and non-human dwellers are taken into consideration. More precisely, we theorize how arts can function as study material and enable a collective sensitivity for the ways in which (non-)human entities (e.g., fishermen, seals, birds, litter pickers, tourists, plastic producers) constitute a 'sick' habitat. Based upon our theory-driven participatory action research with adult inhabitants of the litter polluted Belgian coast, we conclude that a study pedagogy has the power to constitute collective events of emancipation in which inhabitants of damaged living environments can start to inhabit these places, i.e., they become (more) attentive to the reciprocal relationships with other human and non-human entities and respond accordingly with care towards these entanglements.

Keywords: sustainability education, socioecological justice, critical zone research, study pedagogy, community arts

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Introduction

In this contribution we propose a post-humanist approach to non-formal initiatives with adults, geared at constituting a world that is more just for all. More precisely, we theoretically develop a form of adult education that can be regarded more inclusive compared to existing discourses which are human-centred and which are mostly limited to formal learning contexts. We do this based upon our theory-driven participatory action research at the litter polluted Belgian North Sea coast. During this research project we focused on the issue of anthropogenic litter pollution, which is broadly considered as one of the major global challenges that we are currently facing (Popa et al., 2022). Caused by increased plastic consumption and poor waste management, it influences the livability of oceans and beaches worldwide, including the North Sea (Falk-Andersson et al., 2019). Scholars suggest that in order to find a way out of this deadlock, there is a need for educational initiatives in which local inhabitants, of all ages, collaboratively investigate the litter pollution in their environment (Ammendolia & Walker, 2022).

However, in existing literature on education and ecological justice, much attention has been paid so far, first, to the role of schools and universities, i.e., formal education. The underlying idea is that young people should be equipped with the right knowledge and skills in order to become the sustainability stewards of the future (Amsler & Facer, 2017; Holfelder, 2019). Second, the conceptualization of justice in educational research has for a long time only included the interests of human beings (Goodwin & Proctor, 2019). As a response to the first tendency, educational scholars like Casey & Asamoah (2016) and Pritchard & Gabrys (2016) have increasingly begun to underline the pivotal role of non-formal adult education due to the high urgency of issues like anthropogenic litter pollution. Their argument is that we cannot wait for formal education to prepare future generations. Moreover, people of all ages are considered to have a stake in current sustainability challenges and therefore *all* generations have to be mobilized. This growing attention for non-formal adult education is mainly reflected in a body of research and policy texts on lifelong learning in communities where access to formal education is less evident (Aguayo & Eames, 2017; UNESCO, 2019). As a reaction to the second tendency, new perspectives have started to question the taken-for-granted hierarchy between humans (as active agents) and non-human entities (as the mere natural background of human action). This so called ‘post-humanist turn’ in educational research has integrated ecological concerns and animal rights in order to include multispecies entanglements in educational initiatives (Aedo et al., 2019; Griswold, 2017)

Situating ourselves within these two emerging bodies of literature and building further on the work done by philosophers Bruno Latour, Isabelle Stengers and pedagogues Hans Schildermans and Jan Masschelein, we introduce a new understanding of *emancipation*. One that goes beyond the classical idea that it is merely situated within the social, human sphere. More exactly, based upon our theory-driven empirical work, we suggest an alternative, post-humanist approach to emancipation in which there is (1) more attention for justice beyond human interests and (2) in which the aim is not to get liberated from restraining social, cultural, economic or ecological bonds, but instead to become more receptive of our (non)human attachments (Latour, 2005). Doing this, we want to draw attention to adult educational initiatives in which local inhabitants collectively learn to *become-with* the forms of life that dwell in their habitat. We henceforth introduce the concept of *inhabitation*, which describes the process of becoming ever more attentive to one’s entanglements with other human and non-human entities and to respond to these new attachments with care.

In the first section of this paper we detail how we developed what we will call ‘requirements’ in order to artistically visualize and collectively study the litter pollution of the Belgian North Sea. In the second section we show in which way these requirements were operationalized in a *study protocol* that shaped the *public study experiment* that we conducted with a group of participating adult inhabitants of the concerned area. In the third section we discuss how during this educational experiment particular litter streams were represented by an artistic sculpture and *problematized* during four *study sessions* at the Belgian coast. In the concluding part we show how the deployed inclusive study pedagogy can foster new forms of thriving with (non)human entities in a way that can be more just for all.

Three pedagogical requirements for a Critical Zone Observatory

Based on the work of Bruno Latour and Isabelle Stengers on collaborative research practices, Hans Schildermans argues that specific conditions or rules of engagement are needed, which he calls *requirements*, in order to constitute events of *collective study*. More precisely, the concept of requirement points towards carefully designed and assembled tools, procedures and participants, which enable a group of people to collaboratively study an urgent issue in their living environment (Schildermans, 2021). Inspired by the theoretical work done by Latour, Stengers, Schildermans and Masschelein, we decided to collaboratively design, together with local adult inhabitants of the Belgian coast, a *study experiment* on local litter disputes. For this experiment, we built a theoretical framework consisting of three requirements, which we detail in the next section. First, we discuss how we investigated the litter polluted Belgian coast as a *critical zone* (CZ). Second, we explain the pivotal role of arts in rendering people sensitive for the litter pollution in this area, and third, we explain how a process of problematization can reopen existing understandings of the concerned issue.

First requirement: investigating the Belgian coastline as a Critical Zone

Our participatory research at the Belgian coastline (geared at collaboratively designing the study experiment) started from the observation that this coastline can be defined as a sick stretch of territory due to the excessive amounts of marine litter, impacting both marine biota and human health (Falk-Andersson et al., 2019). As mentioned above, the first requirement for the study experiment is to investigate this damaged area as a CZ. More precisely, we draw inspiration from Latour’s suggestion (2016) that place-based public investigations are needed in order to arrive at a proper and shared understanding of how a sustainable collective life could look like in damaged living environments. In order to come to an idea of how these investigations could be designed, Latour (2014) draws inspiration from the network of *Critical Zone Observatories* (CZO) in the US. These are observatories of scientists who aim to understand how entities like trees and rivers in a delineated area interact with human actors. CZs are habitats that are ‘sick’, because human and non-human entities are affected in their possibilities to flourish (Gaillardet, 2020).

Thinking in terms of CZOs comes with a reinvention of the soil sciences, meaning that several disciplines are mobilized to equip zones like a watershed or a mountain hill with *haptic* instruments in order to fathom the complex processes taking place there (Latour, 2014). Derived from the old Greek word ‘haptikos’, i.e., to get in touch with something, these instruments function as *interfaces* that help people to get in touch with different forms of life outside oneself and the way how the self and the world are being

mutually shaped (Swillens et al., 2021). In CZOs people map and represent, with the help of instruments, the complex flows of entities present in the concerned area. In this way, through haptic interfaces, people can become sensitive to how their entanglement with non-human forms of life influences the liveability of the investigated place (Latour, 2014).

Moreover, this entails that one starts experiencing one's living environment as a *habitat*. This stands opposed to the classical discourse on inclusion in which the natural environment is seen as the mere background or stage scene for human action, against which human history takes place. Justice is then situated in what is regarded as the only relevant sphere: the social (Aedo et al., 2019). In his work on global challenges like mass migration and climate change, Bruno Latour (2017) states that ecological issues (e.g., anthropogenic litter pollution and climate change) are always *socio-ecological*, meaning that the struggle for social justice and for taking care of our natural environment are not separate endeavors. Instead they are two sides of the same coin. Hence, if we aim to engender an hospitable North Sea coast, we have to move towards more inclusive ways of deliberation in which the conditions for a decent life for both human (e.g., fishermen, tourists, coastal inhabitants) and non-human entities (e.g., fish and sea mammals) are considered. For this to happen, however, it would be essential to first investigate how the Belgian North Sea coast consists of multispecies struggles for individual and collective survival and how litter pollution affects this.

Henceforth, speaking about a habitat as a CZ implies seeing an area as a territory in which human and non-human entities try to thrive and where there is no a priori correct understanding of what a just way of living together entails (Latour, 2018). Habitat derives from the Latin word 'habitare' (to dwell). As such, it emphasizes the active and never ending process of building a livable haven. What the concept of CZ adds is that all forms of life (human and non-human) are interdependent for their survival. Any attempt to fully detach from local (non)human bonds therefore results in a loss of sense of really inhabiting a place. When local inhabitants are encouraged to investigate an ecologically damaged area as a CZ, they thus have to do this from *within*, as concerned and attached inhabitants and not from a seemingly neutral distance, deploying an objectifying gaze (Tresch, 2020).

Second requirement: art and creating matters of concern

A second requirement that we installed is to experiment with *artistic* creations and interventions that function as haptic interfaces. According to Latour, the *aesthetic* efficacy of arts consists of its capacity to creatively draw various flows of humans, animals, plants, stones, water etc., dwelling in a CZ, into a material representation that can start to matter to people (Latour, 2015). Building an artistic installation can be especially effective when mapping and representing a complex assemblage of litter streams that are highly dispersed in both time and space. Think about fishing nets trapped in ship wrecks, plastic bottles going with major ocean streams and degraded microplastics being buried in the sand. These characteristics of litter put our thinking capabilities to the test and exceed what is considered possible to understand, especially when our own existence and that of animals is tied into litter fluxes. Art installations in this regard can help to become attentive to details and contrasts within such complexity and to challenge our existing perceptions of the world.

In addition, arts have the aesthetic potential to transform *matters of fact* into *matters of concern* (Latour & Weibel, 2020). Matters of fact are artificial constructions of reality that are expected to indisputably speak for themselves. This results from ignoring the

complex assemblages of human beings, procedures and (scientific) instruments that are required in order to construct a (scientific) fact (Latour & Woolgar, 1979). More precisely, these facts are presented as universal truths and in that sense not grounded in the reality of problems that they represent. Matters of fact are thus regarded as claims that are obvious and indisputable and therefore often used to shut down deliberations about an issue (Latour, 2008). In contrast to a matter of fact stands the construction of matters of concern, which

[i]s what happens to a matter of fact when you add to it its whole scenography, much like you would do by shifting your attention from the stage to the whole machinery of a theatre.... Instead of simply being there, matters of fact begin to look different, to render a different sound, they start to move in all directions, they overflow their boundaries, they include a complete set of new actors, they reveal the fragile envelopes in which they are housed (Latour, 2008, p. 39)

Matters of concern put matters of fact to the test as they start to form a complex of disputable issues (Latour, 2004). Arts in this regard can function as a haptic interface as it has the ability to stage and create a sensitivity for the ‘whole machinery’ around a problem (Latour, 2008). More concretely, arts can represent in a creative way how human and non-human actors are intimately entangled around socioecological problems like anthropogenic litter pollution. The visualization of these entanglements through arts reopens matters of fact by allowing new actors to overflow and complexify existing representations.

For Latour a matters of fact approach leads to *objectivism*, i.e., the shutting down any further deliberation. Opposed to this stands the concept of *objectionism*, which refers to the process of allowing for as many objections as possible towards prevailing understandings of a problem (Latour, 2018). In this way, complexity is added to facts that otherwise appear as neutral, trapping us in a cycle of deathly repetition (Guattari, 1989). Making art, hence, becomes a matter of composing and forging new links between entities that were previously considered non-existent (Felski, 2015).

Third requirement: problematizations through propositions

A third and last requirement of this CZ research at the Belgian coastline is to foster *educational* inclusion by collectively *problematizing* a matter of concern. In the work of Latour, political inclusion mainly plays a crucial role in deliberations about which forms of life we want to protect (e.g., declining seal population) and which ones to fight against (e.g., industrial fishing industry). In politics, as Latour wants it, one represents an existing voice and takes a predefined position in order to protect a form of life that is in need of defence (2017). The problematization of the relationships between these forms of life, by collectively studying it, is in this regard considered less relevant because one merely has to defend existing positions. However, based on the work of educational scholars like Hans Schildermans (2021) and Jan Masschelein (2019), we advocate for the relevance of fully disentangling how the complex interweavement between (non)human entities causes a habitat to become sick. This implies that one not just visualizes the whole machinery behind a matter of concern, i.e., the complex entanglement of human and non-human entities constituting a litter related problem, but that one also *problematizes* these interrelations, i.e., one reopens and reconsiders them among a public of involved stakeholders (e.g., Schildermans, 2021). Such a *study pedagogy* consists of practices of collective inquiry wherein people (experts and non-experts alike) are brought together and start to investigate a problem, but where they do not immediately have to come up

with either technological solutions or political statements as it the case in purely political deliberation. The word study thus hints towards a slow and collective thought process *whilst* constructing matters of public concern (Swillens & Vlieghe, 2020).

What is at stake here is to engender inclusion in a *pedagogical* way, rather than a political one, i.e. to foster an attention towards one's entanglements with other human and non-human entities and to respond to these new attachments with care. This can be supported by the formulation of what Masschelein (2019) and Schildermans (2021), building further on the work Isabelle Stengers, call *propositions*. These concern incitations that are offered to others for consideration or acceptance, i.e., proposing new ideas for reflection or action without expecting the other to immediately take a political position. Instead, the goal is to allow for an attentiveness to emerge and to approach a matter of public concern in a nuanced, objectionistic way. More precisely, concrete *study materials* (like art installations, documentaries and maps) can foster the formulation of such propositions because these artefacts visualize and make present new dimensions of a problem, potentially *objecting* seemingly obvious positions. Propositions are in this regard not at the same level of mere opinions or political claims, which are inseparable and directly linked to a person or a group.

In what follows we discuss, based on our empirical data (interview transcripts and observations), how a socio-ecological problem can be turned into a matter of concern. And how with the help of such a study pedagogy a post-humanist educational approach to inclusion can be fostered. For this, the first author of the paper worked intensively together with a group of adult inhabitants living near the Belgian North Sea coast, e.g., fishermen, beachcombers and animal activists.

Creating a matter of concern with the help of litter arts and a study protocol

Based upon the three formulated requirements, we designed the pedagogical study experiment in collaboration with adult inhabitants of the Belgian coast. More concretely, during a period of a year, we transformed disputes among opposed stakeholders like fishermen and seals guardians, all related to litter pollution, into a matter of public concern. For this we deployed an art installation that we made from locally collected litter. Put shortly, during the *first* phase of our participatory action research, and as a preparation for the later study experiment, we traced how human (e.g., fishermen, animal rights activists) and non-human actors (e.g., seals, fishing vessels) are intimately entangled with litter pollution disputes in the concerned CZ. The main researcher did this by conducting walking interviews on the Belgian beaches. Subsequently, during the *second* phase, we discussed these traced frictions and decided, together with a diverse group of local inhabitants, to focus on one urgent issue, i.e., the death of seals by specific marine litter resulting from fishing activities along the coastline. With this specific matter in mind we designed and built, in the *third* phase, an art installation (as haptic interface) in order to represent the complex variety of litter streams caused by the fishing industry. During the final, *fourth* phase, we finally designed and conducted the public study experiment. Hereby these litter streams (and its impact) were problematized (via the art installation) among a public of local adults, e.g., fishermen, animal rights activists, tourists, nature guides.

First phase: tracing litter disputes

With the help of a notebook, the main researcher initiated the first phase of the participatory action research by conducting a dozen walking interviews on the beach with beachcombers (local people who regularly clean the beaches), a local fisherman and animal rights activists.

Starting from the requirements outlined above, we traced and inventoried the concerns that these people articulated about the litter pollution of the Belgian North Sea. Gradually it became clear that frictions exist around the pollution caused by the fishing industry along the North Sea coastline. In particular the death of sea mammals due to drifting fishing litter (e.g., ghost nets and hooks), was mentioned as an urgent and controversial concern. Animal rights activists especially pointed towards the injustice (e.g., decapitations) to the growing seal population in the North Sea. At the same time, fishermen appeared to feel solely blamed for the marine litter pollution in their fishing grounds, despite their recent efforts to bring litter back ashore.

Second phase: slowing down militancy

Following these explorative interviews, we publicly addressed the issue for a first time during an explorative workshop in the major coastal city of Oostende. The goal of this event was twofold: (1) to come to a substantive starting point for the collaborative enquiry and (2) to gather a group of adult volunteers for the planned collaborative enquiry on the problems caused by the polluting fishing industry at the Belgian North Sea coast. More precisely, around thirty local inhabitants responded to an open call on social media and came to the event, where they were asked to brainstorm in which way problems related to marine fishing litter could be further investigated. More concretely, we asked the attending beachcombers, fishermen and animal rights activists to first discuss the traced frictions into small groups after which we would plenary try to come to a shared starting point for the collaborative enquiry.

During the plenary session, it appeared that fishing nets at the Belgian coast are strongly related with a great variety of entities like fishermen, seals, local, regional and national lawmakers, beachcombers and animal rights activists. It was emphasized that these nets have a negative impact on the growing population of seals, but that professional fishermen increasingly try to tackle the problem. However, still many questions remained. For instance about the specific types of damaging fishing nets and the precise role of the Belgian fishing industry in the pollution. An indication that it might be too early to bring the matter into the political realm, i.e., representing harmed entities (e.g., seals) and deciding about more sustainable ways of living together. The reason was that the complex interweavement of human and non-human actors surrounding the problem was not yet fully clear, which is crucial if one wants to engage with the problem in a proper way.

Despite these uncertainties, some of the attendees demanded immediate action and proposed to go on the streets to march for a more sustainable North Sea. This is an illustration of what Isabelle Stengers would call an urge for *mobilization* (Savransky & Stengers, 2018, p. 139), i.e., ‘to pay no attention, to classify what may slow down as an obstacle’. In these situations, attention for the complexity of urgent matters of concern can be undermined because further questioning is considered to be a waste of crucial time. Such an approach, however, entails that education could be reduced to mere *instruction* i.e., the telling of stories that are too simple. In other words: education is narrowed down to conveying objectifying matters of fact. It was exactly this what we

wanted to avoid and we realized that this urge for mobilization could hinder the further unraveling of the emerging matter in this CZ.

In response to this, the moderator of the evening (the main researcher) asked the attendees if political slogans could also be turned against them, especially if these are not well-funded and well-contested. One of the beachcombers responded as follows:

Concrete action in the sense of 'we are going to go out on the streets and we're going to demonstrate against the fishing nets' is something I don't want to advocate for. I would rather plea for a further commitment to collect information [about the issue] and only take collective action based upon that information.

A local animal rights activist added that:

[...] we should first get a better understanding of what kind of nets are actually found on the beaches and the link between the different disciplines is very important for this. Only then we can strengthen our current understanding of the problem.

At stake is thus the creative and transformative potential of collective thought. For this, we first had to further investigate the matter before answering questions about which actors should be protected, which to fight against and how to constitute a world that is more flourishing for those currently limited in their thriving (Latour, 2018).

After the discussion about whether to take immediate political action or not, the moderator of the plenary session initiated the idea of constructing an artwork in order to represent the concerned matter, which could help to foster the involvement of a broader public into investigating the issue. One of the beachcombers was not convinced about the usefulness of this and argued that the only real solution would be to keep cleaning the beach with as many people as possible. At the same time, others suggested that by merely doing that, there would be no solution for the cause of litter pollution in the concerned area. An artistic intervention could, as was argued by the moderator and endorsed by some of the attendees, help to involve a broad public of involved actors related to the matter. Without immediately portraying certain groups as guilty, by making bold and objectifying statements, and without lapsing into a too abstract approach (e.g. complex scientific graphs). In addition, it was emphasized by some of the beachcombers that making and sharing pictures of gathered litter (a common practice among beachcombers) was not enough to provoke people into thinking collectively about the problem. Put differently, one could say that the aesthetic quality of arts in evoking a shared, new attention for the problem was touched upon during this discussion.

It is inevitable that some of the attendees were still convinced about the fact that the political way was the only right way and/or that arts is not the best way to tackle problems caused by marine litter. However, these opposing standpoints also helped to better articulate both the importance of slowing down collective reasoning and the role of arts in supporting that process. All this illustrates how the insights from people living within the zone and an external researcher can merge into shared aspirations, which comes close to the essence of participatory action research: building a common understanding of the actions to be undertaken by engaging in collective reflection (Lewin, 1946). At the end of the workshop, we came to the conclusion that if we were going to build an art installation it had to be publicly displayed in the damaged area itself, i.e., on the beach. In this way, those people dwelling in the habitat would be able to contribute to a better understanding of the matter.

Third phase: developing the study protocol and building the art installation

During the months after the workshop, we gathered a group of twenty adult coastal inhabitants with whom we worked on the idea of building an art sculpture that could represent the complex streams of fishing litter harming the growing seal population, e.g., plastic fishing nets, nylon fishing nets, synthetic rope. After a few gatherings in the coastal cities of Oostende and Middelkerke, we decided upon the idea of building a mobile art installation that would depict the Greek goddess of the sea, Amphitrite, and to let her make a four-day long journey along the Belgian coast, passing by four of the most polluted Belgian beaches.

However, merely showing the art installation was considered to be insufficient and we organized a special meeting in order to discuss how we could involve different relevant actors related to the represented matter and to let them deliberate about the problem (e.g., fishermen, divers, aquafarmers, nature guides, beach combers, animal right activists). At this moment we brought in a study dynamics, as detailed in the first section of this paper. More precisely, the main researcher proposed to work with a study protocol, i.e., rules of engagement in relation to the art installation. These rules were inspired by the three requirements outlined above and were aimed at representing in a creative way the complex entanglement of fishing litter in this CZ and at investigating collectively the problems caused by these litter streams.

More precisely, the goal was to foster the formulation of *propositions* in relation to the art work, which accordingly could start to function as study material. In this way, new propositions could object existing understandings of the investigated matter of concern. After a long deliberation we finally decided upon the following study protocol:

1. Universal claims and generalizations about global litter pollution should be avoided because these run the risk of not being concerned with the marine litter streams in the investigated zone. For this, the art installation should only be built with local litter objects. And during the studying, every articulated proposition should relate immediately to these represented litter streams and stem from one's own relationship towards it. Only in this way, the problem can be studied from *within* the selected CZ itself.
2. During the making of the artwork, as many relevant litter streams as possible should be represented in the installation. In addition, during the collective study event, as many of the affected forms of life should be represented by spokespersons in order to object a variety of existing positions. More precisely, in order to make study sessions as inclusive as possible, we decided that all affected actors are to be represented by at least one spokesperson. We accordingly came up with a list of those actors who had to be represented: (a) sea animals, (b) the maritime industry and (c) coastal inhabitants.

After we agreed upon these rules, we decided to organize four *study sessions* of about an hour in which the invited spokespersons (seventeen in total) would engage in one of the sessions in order to collectively study the represented matter. Doing this, both human and non-human actors could be included in these educational deliberations. The artwork and the designed rules of engagement thus form a haptic interface that supports the formulation of propositions in relation to the concerned matter. In addition, by not allowing for the articulation of mere opinion and universal claims, the tendency to talk *about* or to speak *for* another is slowed down. Instead, one is invited to take part in a risky

process of thinking *with* and in *the midst of* the presence of other, represented (non-) human residents (Savransky & Stengers, 2016).

Fourth phase: studying on the beach

In the last phase, after several preparatory summer session, during which we built the art installation and invited the spokespersons to act in line with the designed study protocol, we kicked off the four day study initiative at the end of the summer. The building process of Amphitrite was supervised by a local artist and her close friend who have been artistically experimenting with litter objects in the past. Both women also turned out to be crucial gatekeepers to local communities of fishermen and aquafarmers. Many of the invited spokespersons either had been directly invited by them or by the main researcher, always using a reference to the two gatekeepers. This made a significant difference because the topic of litter pollution is highly contested at the Belgian coast. As discussed earlier, local communities of fishermen are often portrayed by the general public as stubborn polluters and the mutual trust between the two women and their community was therefore paramount.

The four day event started with a study session at the polluted main beach of the coastal city of Nieuwpoort. Three more of these sessions followed in that same week: one in Westende (second day), one in Middelkerke (third day) and one in the major coastal city of Oostende (fourth day). We deliberately chose for the summer months, because many tourists would flock together on the beaches, and they might attend the organized activities. In order to explain the set-up of the study sessions towards the public on the beach, a group of volunteers accompanied the mobile art installation (see figure 1), before the activities would begin.

During the four public study sessions, local divers, industrial fishermen, official scientists, seal guardians, beach combers, aquafarmers, amateur fishermen and nature guides were invited to act on the beach as spokespersons. This always happened in front of a public of tourists, invited politicians and interested people who read about the project in local newspapers and on social media. All four sessions were moderated by the main researcher and they started by asking the spokespersons to detail which of the represented litter streams they recognized in Amphitrite and how these influence or are influenced by the actors that they represent. In that sense, the moderator acted as a *diplomat* towards the dwellers of this CZ, i.e., diplomats ‘are those who do not address humans in general but humans as attached, as diverging, and they need to have protagonists presenting themselves together with these attachments’ (Savransky & Stengers, 2018, p. 142).

Figure 1. A group of local volunteers accompanying the art installation and engaging with visitors of the beach (authors' own figure).



Results of the study experiment

During the building process of the art installation we intensively discussed about which type of litter streams are important in relation to the investigated matter of concern, i.e., the death of seals caused by the fishing industry. In order to have as many of the damaging litter streams present in the artwork (one of the rules in the study protocol), we consulted three relevant organizations situated at the Belgian coast: Fishing for Litter (fishermen who try to clean up the sea), Proper Strand Lopers (beachcombers who voluntarily swipe the Belgian beaches) and NorthSealteam (volunteers who guard the Belgian seal population). Based on these consultations we selected a variety of fishing nets (e.g., models for catching shrimps, trawler nets and wrangle nets), but also hooks and floaters, all made from a variety of materials like nylon, plastic and cotton.

The artificial concentration of these litter streams within one single art installation (as haptic interface) enabled the spokespersons to get in touch with these varied litter objects. In addition, the study protocol, with its rules of engagement, transformed the artwork into material that could be collectively studied. More precisely, and as we will detail below, it made it possible for those present to (1) weave new dimensions of actors (both human and non-human) into the represented litter issue (see section *Interweaving litter streams and actors in time and space*) to (2) collectively problematize these new dimensions via propositions (see section *Problematizing existing positions*) and to draw rich and robust sketches of the studied problem (see section *Drawing new sketches of the concerned matter*).

Interweaving litter streams and actors in time and space

During the first study session, in the coastal city of Nieuwpoort, a local diver pointed towards a particular type of fishing nets that was represented by Amphitrite, i.e., trawler nets, and described how he regularly encounters these near old shipwrecks. He explained that the material for these nets is very strong and that divers could get stuck due to their heavy gear. By sharing this anecdote the diver enriched the portrayed image of the deliberated litter stream. More precisely, as a spokesperson of the diving community in this CZ, he wove a new *spatial* dimension into the represented matter of concern, by telling about the unsustainable situation underneath the water level, caused by trawler nets. For many people, this new dimension is something that they do not get in touch with due to the inaccessibility of these ship wrecks. Within this spatial dimension, under the water level, the litter stream of trawler nets got intimately interwoven with sunken ships and the community of local divers. A local fisherman responded to this anecdote by explaining that nets sometimes get stuck in these wrecks and that often there is no other choice than to cut these, otherwise their vessel might capsize. *Weaving acts* like these, as Donna Haraway (2016) calls it, have the force to bring together a variety of truths within a shared present, adding new dimensions to socio-ecological issues.

However, these weaving acts not only occurred in space but also in time. More concretely, during the study session at the beach of Westende (second day), two amateur fishermen, who fish very closely to the shore, detailed how in the past many local fishermen intentionally polluted the sea by dumping all their household waste in it - even fridges and old mattresses. This was a reaction to the proposition of an animal rights activist who stated that many of the seals are suffering due to fishing hooks and nets of fishermen (streams represented within Amphitrite). Nowadays, due to strict regulations, intentional pollution is less common among fisherman according to the two spokespersons. However, at the same time, they mentioned how an important increase of tourist litter can be noticed near the shoreline. Think about soda cans, plastic cany wraps and single use plastic toys. As a response to this, the head of the regional animal rescue center suggested that sea animals like the northern gannet and seals take in particles of these degraded litter objects, causing major damage to their guts.

In this way, a spatial and temporal weaving occurred. Actors like divers, old and young fishermen, recent policies and particular litter streams (tourist litter and household waste) became more or less densely entangled with the litter streams represented in Amphitrite.

Problematizing existing positions

During the course of the four day initiative, several people who depend for their livelihood on the North Sea (e.g., industrial fishermen and aquafarmers) were for the first time directly confronted with spokespersons of those forms of life suffering from these economic activities: the head of the regional animal rescue center, a local nature guide and the head of the Belgian seals organization. By describing how seals are exactly suffering from particular marine litter streams and by articulating what these animals might need for their survival, these non-human dwellers started to become highly present in deliberations about the sick condition of the concerned CZ. Below, we present a short fragment of the last study session in Oostende in which a local fisherman and a seals guardian intensively deliberated the harm caused to seals by the industrial fishing industry. Interestingly, the local fisherman used the artwork in order to object the position

taken by many animal rights activists, i.e., that Belgian fishermen's nets cause major damage to the Belgian seals population.

Excerpt from transcribed study moment, Oostende (Day four):

Seals guardian: We regularly see seals washing ashore because they have a net around them ... they come to rest or to die with us.

Fisherman: We actually come across nets like that [points to a type of net in Amphitrite], these are nylon tangle nets. This is the French type and these are actually very sharp. As you can see, they have a different structure compared to the other nets in the sculpture. You can compare these nets to fishing lines that cut murderously.

Seals guardian: Yes it is often said that the fishermen are very negative towards the seals, but we have noticed in the last few days that the fishing industry is seemingly becoming more alert and also wants less litter pollution in order to protect the seals. But of course, there are still these nylon tangle nets in France and seals can still get hurt there and wash up or come here to rest. So for seals too, it is important to look internationally and not only at our little piece of Belgium coast.

Fisherman: Yes, the sea has no borders. First of all ... a lot of litter travels through other fishing grounds and unfortunately we are not always allowed to go there and to take the litter with us. Therefore, working together across borders is really important. When we are fishing here, we have rules, but a few kilometers across the border it is suddenly different. You know, for us fishermen it is sometimes very difficult to deal with these changing local regulations. We want fish to be healthy and I don't want seals to suffer due to our fishing activities. That is why I would want to say: be attentive to the efforts that the Belgian fishing industry wants to undertake and try to support this. Also, the collaboration among different stakeholders is crucial because only together we can be strong in this.

This fragment illustrates how a spokesperson of the seals is confronted with a *proposition* formulated by a spokesperson of the professional Belgian fishing fleet. In this particular instance, the fisherman used the art installation as *study material* in order to shape his proposition about the French fishing fleet, which accordingly functioned as an *objection* towards the position taken by several animal rights activists. The spokesperson of the seals replied by formulating a new proposition, suggesting that marine litter cannot be contained within existing national borders. Due to the interweaving of a new relevant actor: French fishermen's nylon strangle nets, a redefinition of the problem occurred at that particular moment. This process did put existing reasons to the test of newly emerging dimensions, forcing the spokesperson of the seals to respond towards what had been left out in the formulation of the problem (Stengers, 2021).

By responding as a *studier*, i.e., considering the proposition in relation to the study material, and taking care of the emerged dimension, the *problematic* could become actualized (Deleuze, 1994). More precisely, the seals protector decided not to understand the problem as it is usually formulated by animal right activists (the way a militant would do). Instead, she added a new dimension to it and became open to potential ruptures in her own thinking. In this way, she stayed close and attentive to the problem (Haraway, 2016), creatively opening the present view, in which a response was demanded, without others determining what this had to be (Schildermans, 2021). Accordingly, by considering the proposition of the fisherman, a process of problematization was fostered among those present, making the existing story about the death of seals more *interesting* (Savransky & Stengers, 2018), i.e., in the original Latin sense of the word: a shared (inter) reality (esse). It is important not to confuse these moments of multispecies proximity with a state of *unity* in which the differences between forms of life are seen as an obstacle to be overcome (Braidotti, 2019). Instead, by engaging with the matter in an *educational* way, i.e.,

studying the newly emerged dimension, it became possible for the spokespersons and the public to start experiencing a dense present in which existing ideas about litter pollution were put to the test (Stengers, 2021). Doing this, the differences among co-inhabitants are approached as a source of relational knowledge and mutual transformation.

Drawing new sketches of the concerned matter

By collectively problematizing over four days the precise definition of what litter pollution is and in which way different actors are involved, *richer* and *more robust* sketches of the issue were drawn. More concretely, these sketches became more *rich* by encapsulating an ever growing amount of actors and more *robust* by problematizing the relationships between these actors. However, new sketches inevitably also evoked other questions to be studied (Savransky, 2021), triggering even more configurations across time and space.

But at a certain moment, closure has to be achieved. At the end of the last study moment in Oostende we presented the conclusions of the consecutive study sessions towards a group of local inhabitants and politicians. The aim of this act was to publicly present the newly drawn sketch of the studied matter in front of a public who could take action with the refined and collective problem analysis in mind. Doing this, the goal was to show how deliberations can be more *inclusive* towards non-human actors like seals and foster a more rich and robust sketch of an urgent problem: enabling a shared, *objectionistic* view on the matter. However, there is always the lurking risk that these fragile, newly composed analyses become reduced to bold matters of fact, serving as simple political statements. This in fact happened when a journalist of a regional television channel interviewed the main researcher and a local politician right after the end of the last study session in Oostende. The journalist was persistently steering towards the need for higher tax on plastic waste and by editing the footage in particular ways, the interview was instrumentalized for mobilizing the general public towards this particular idea. For the participants of the event, this stood in sharp contrast with the collective and hesitant formulation of arguments during the study session of that same day. More precisely, there was a general feeling among the volunteers that the urge for mobilization by this journalist had created a story about the litter pollution that was cut much too short (Savransky & Stengers, 2018).

Conclusion: inhabiting the Belgian coast by becoming studiers

With the help of the formulated rules of engagement (*study protocol*), as well as the art installation (as *study material*), education was brought to the centre of public deliberations in this sick habitat. We did this by excluding the idea that unambiguous answers exist and allowing for collective moments of *problematization* through which existing assumptions could become undefined again. The invited spokespersons were thus approached as *studiers* and not as militants. By building Amphitrite as artistic *haptic interface*, a shared attention for specific litter streams was cultivated, rendering the different spokespersons sensitive for how their living environment is influenced by these litter streams. By collectively studying these streams, both in space and time, the involved spokespersons (as studiers) shaped a new, common sense of the investigated problem. Crucial in this was the role of the art installation, which functioned as a crowd of interconnected litter streams, with which the studiers forged new links across time and space (Felski, 2015).

In addition, with the help of the designed study protocol educational events, in the strong sense of the word, could emerge in which ‘all protagonists become more intelligent because of the others, together with others, all actively learning about the kind of world they live in’ (Savransky & Stengers, 2018, p. 139). Local inhabitants started to collectively learn to become-with the actors that dwell in their habitat. It is to such a process that one of the volunteers pointed after the four day event ended:

Participating in the project made me feel very involved with my living environment. A kind of involvement with more than just the people in one’s immediate surroundings, also with the wider world than that one of myself... you start to see more and more the consequences of litter pollution. So your view actually gets broadened the more you hear and see. Instead of the narrow understanding of ‘my beach’, it opens it to a bigger picture of our living environment.

However becoming with other actors in one’s living environment doesn’t merely implicate getting more attached, but also requires a response to these new attachments. It is this what another volunteer of the project emphasized when interviewing her after the project:

I certainly take with me that it is important that we, as seal guardians, should make the connection with marine litter pollution. After the project, I look at the flood line differently... one starts to dissect more and more things in the environment. For example, this weekend at the beach I started collecting all kinds of marine litter like a balloon and pieces of fishing nets. I’m going to put all that in a tube and take it with me when I’m monitoring the seals so I can explain about this.

To articulate what happens here we must introduce the concept of *inhabitation* (Swillens et al., 2021). This regards the process of becoming ever more attentive to our entanglements with other human and non-human actors. During this process we also start to respond more carefully to these attachments. Inhabiting a living environment thus means to dwell on a soil to which one belongs ever more, but that belongs to no one in particular. When starting to inhabit your living environment, new attachments are being forged and the idea of a human-centered, detached criticism towards litter pollution doesn’t make sense anymore. Instead, adults living in the investigated CZ collectively made sense of what might be possible for this habitat in the future, taking into consideration the stakes of other actors in the territory. Crucial is that this happened from within, i.e., as attached and concerned studiers. It is what Donna Haraway (2016) describes as a becoming *response-able*: making thought creative in new ways of living together other than those that are being considered as unavoidable or obvious.

All this has major implications for the issue from which we started, viz., how more inclusive ways of deliberation in non-formal adult education can contribute to a more just way of living together in litter polluted CZs. Existing literature on adult education and justice often conceives of inclusion in terms of emancipation that is situated merely at the social and human level. More precisely, emancipation is seen as the liberation of oppressed people from social, cultural and economic bonds that restrain them. In this way, people can start to participate fully in society. Based upon the pedagogical experiment that we conducted at the Belgian North Sea coast, we suggest that studying in CZs, with the help of constructing an artwork, has the force to effectuate a different form of inclusive justice in which all people can become ever more receptive to their (non)human attachments. Such a growing sense of attachment cannot be reduced to the acquisition of new knowledge about litter pollution and its impact. On the contrary, and as illustrated by the two participants above, it is in the first instance an *ontological* transformation of

the self as a caring inhabitant of an ecologically damaged and socially unfair world. Emancipation is accordingly to be understood as a collective making and remaking of our relationships with the environment we are dependent from, while at the same time being aware of our reciprocal entanglements with other forms of life (Latour, 2015). All this entails that if we want to design inclusive educational experiments that can contribute to a more just world for both humans and non-humans, we only can do this by taking people in sick habitats, of all age, seriously in their ability to become studiers and to think beyond human-centered and universal statements about justice.

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