Dancing Urban Waters. A Posthuman Feminist Perspective on Arts-Based Practice for Sustainable Education

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Introduction

While sustainability has become a must (and a frequent buzzword) in academic education, the choices related to content, methodologies, epistemological background and learning objectives are often underestimated, and each requires a certain educational context in order for an active position to be adopted.

The authors claim that sustainability cannot be just “another subject” to be added to course plans (Van Poeck et al., 2020). The complexities and uncertainties we are currently facing require us to ask radical questions about traditional pedagogical approaches and learning methods (Stibbe, 2009).

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Moreover, despite an increasing drive towards the introduction of sustainability into academic courses, the challenges are not the same across all the various disciplines. For instance, in management studies, considerable work has been done on defining a set of principles in the hope that might make managers’ practices responsible and commit them to more ethical ways of doing business (UNPRME, 2007). But how these principles might be used as guidance for action remains an open question. A certain level of understanding of sustainability is implicit in engineering education, in particular as regards technical expertise (in energy and environmental engineering, for example), which frames sustainability as a matter of problem-solving and providing the best possible technical solutions. In this case, it might be a challenge to expand an understanding of sustainability beyond technical innovation and to take account of the sociomaterial conditions of technology in use (Akrich, 1997; Orlikowski, 2007; Suchman, 1987), decision-making processes, power relations and established working professional practices (Bruzzone, 2019). As Stibbe (2009) argues, a problem-solving approach and intensive specialisation of disciplines will not be sufficient to tackle the severe problems of a post-Anthropocene era. The risk here is that there is a limited understanding of the sustainability challenges, in particular the level of complexity and uncertainty, and the political significance and ethical choices associated with a post-Anthropocenic future. For this reason, new skills and sensibilities capable of attaining a more complex, multi-faceted view of sustainable transitions are needed, as well as new tools to navigate this complexity.

In this regard, it has been said that education on sustainability needs to expand learning methods and the dominant conceptualisations of knowledge to include the realm of aesthetic enquiry, where knowledge is seen as coming from the body and the senses (Wall et al., 2019; Gherardi & Strati, 2012). The arts and embodied types of practices are being increasingly called into play because of their potential for developing more sensorial and relational experiences of sustainability and of Anthropocenic conditions (Concina, 2019). Similarly, natural scientist Stephan Harding (2009) has asserted the importance of developing four ways of knowing—thinking, feeling, sensing and intuition—in order to explore and restore our sense of commonality with and connectedness to the world.
This chapter invites readers to explore how posthuman feminism (Cozza & Gherardi, 2023; Ringrose et al., 2018) can expand the acknowledgement of sustainability in the framework of engineering education by creating a dance practice as a part of a course for civil engineers.

Posthuman feminism (Cozza & Gherardi, 2023; Ringrose et al., 2018) brings together a number of conversations from different fields that share an interest in alternative epistemological paths and practices: philosophy (Barad, 2007; Braidotti, 2013; Haraway, 2016), education (Lenz Taguchi, 2011), organisation studies (Gherardi, 2019), the arts (Ingvartsen, 2016) and post-qualitative studies (Lather & St. Pierre, 2013).

Our contribution travels across some of these conversations, and draws on our experience of organising an arts-based workshop on sustainable urban water as part of a course for industrial engineering students.

As a central factor in the development of modern cities (Picon, 2015), urban water has been primarily acknowledged by engineering science in mathematical terms and as a question of measurement, quantification and control in order to tackle health emergencies and flooding and to provide drinking water. This is what Linton (2010) calls “modern water”. In this context, water becomes abstract, quantifiable and knowable thanks to the scientific knowledge that makes water “one” (Linton, 2010). In recent decades, however, increasingly devastating events (such as flooding, droughts and the rise in sea levels) have begun to call traditional engineering approaches to water management into question. New practices of “making room for water” or “living with the risk” mark a divergence from the logic of control and containment (Carré & Deutsch, 2015; Soyer, 2014) and radically reframe the traditional relationship of cities to this element, especially in the context of the climate crisis. Water in our cities is not just a risk; it is increasingly a precious resource faced with increasingly frequent periods of drought, which affects our ecosystems as well as human health. So how can urban water in its multiple forms be acknowledged as a vibrant issue in the post-Anthropocene era? What pedagogical approaches might be suitable ways of expanding our understanding of sustainability beyond the boundaries of a problem-solving rationality?

The workshop project was born out of a long-term encounter and dialogue between two disciplinary fields, the social sciences and the arts, in
particular dance. On the one hand, there is Silvia’s cross-disciplinary research experience with environmental engineers and her interest in practicing interdisciplinarity as situated encounters of researchers, bodies, objects and places rather than on an epistemological basis (Bruzzone, 2020). On the other hand, there is Henny’s research and artistic-practical experience in feminist and critical dance pedagogy and participatory methods for learning, practising and creating dance in various contexts. Beyond that, they share a love of Argentine tango and engagement in social dance communities.

The workshop can be described as a bodily experiment (Myers, 2012; Nätynki et al., 2023) and a methodology (Coleman et al., 2019) that invites students to explore urban water management risks, especially flooding, through movement and dance as a complement to their formal lectures. It is the meeting between feminist material education theories (Hickey-Moody & Page, 2015) and dance studies and didactics as both an artistic-practical and theoretical field that allows us to consider the role of the body and movement in general, and the potential of creative dance in particular, to multiply ways of learning (Brehm & McNett, 2008). The idea is to make use of creative dance both as an artistic practice and as a learning tool in order to experience and physically engage with materialities involved in flooding on levels that are not only cognitive but also engage feeling, sensing and intuition.

The aim of this article is twofold. First, we present the potential of introducing an arts-based practice—in particular dance—informed by posthuman feminism into the engineering curriculum. Second, we suggest that this experience may contribute to the debate on post-qualitative knowing and learning in the post-Anthropocene era by overcoming traditional boundaries between theory and method and instead focusing on knowing practices.

The chapter is organised as follows. We will first introduce posthuman feminism in education and in relation to aesthetic learning processes, and we will then present the empirical framework and our experimental workshop. Finally, we will discuss some elements that arise out of an analysis of that experience, followed by a concluding discussion.
Posthuman Feminism and Aesthetic Learning Processes

The posthuman turn suggests a move beyond traditional dichotomies such as nature-culture, body-mind and social-material, and introduces a relational perspective in which the attention is on local material and discursive entanglements (Barad, 2007).

In particular, we draw on posthuman feminism (Cozza & Gherardi, 2023), which is a label we use to bring together feminist posthumanism, new material feminism and feminist affect theories (Niccolini & Ringrose, 2020; Ringrose et al., 2018), theoretical perspectives that cut across different fields such as philosophy, management and organisation studies (Gherardi, 2019), education (Hinton & Treusch, 2015) and arts-based practice (Ingvartsen, 2016).

What these conversations first have in common is their departure from “man” as the centre of agency and universal values. As feminist critics (Braidotti, 2013) have noted, the “man” who has characterised “universal” humanity and reason happens to be a healthy, heterosexual and western white man. In contrast to this unitary vision of humanity, feminist thought has, from a posthumanist perspective, sought to acknowledge diversity, inclusiveness and otherness as agentic subjects. “Others” may be women, people of colour, people with disabilities, marginal others and diverse nonhuman others. The departure from humanism has also meant a departure from Anthropos: that is, the exceptionalism of the human species—bios—compared to other species—zoe—and the separation of humans from other beings (Braidotti, 2013). Posthumanism has also focused specific attention on climate, fauna, flora, bacteria, ecological and geological materials, processes and crises (Ulmer, 2017). These conversations also share an understanding of subjectivity as anchored in the body and other materialities. In this sense, it opens up a relational ontology of non-separateness between the self and the other. Emphasis is placed on the continuum between humans and nonhumans mediated by technology (Haraway, 1991) or what we share with other beings in different ways (air, water, bacteria, fungi, etc.) (Mol, 2021). In this regard, different figurations are mobilised, such as the cyborg (Haraway, 1991),
intra-action (Barad, 2007), inter-corporality (Alaimo, 2010) and the nomadic subject (Braidotti, 2011).

Attention then turns to the multiple and chaotic material-discursive assemblages or *agencements* (Deleuze & Guattari, 1987; Gherardi, 2019) of world-making, as well as of the self.

In this framework, politics is linked to ethics and reframed as a constitutive element of assemblage, as attention to what is missing, excluded or marginalised. It is not defined in abstract terms but rather as being anchored in local material-discursive practices (Braidotti, 2006; Neimanis, 2013).

Feminist posthumanism introduces a new epistemological approach, or an ethico-onto-epistemology: knowing and learning do not refer to the reproduction of pre-existing knowledge, but to new forms of knowledge that emerge from material-relational interferences—or doings, beings and respon-*abling*—with the world (Barad, 2007; Lenz Taguchi, 2011; Gherardi, 2019; Haraway, 2016; Braidotti, 2013; Haraway, 2016).

These interferences engage the body and the senses. They are understood as a “capacity to affect and be affected” (Massumi, 2002: 5) and materialise in chaotic cartographies of knowing practices (Braidotti, 2011).

In this regard, posthumanist thought joins the critique of post-qualitative inquiry (Lather & St. Pierre, 2013), which questions the traditional representationalist approaches of humanist qualitative methodology—the separation between theory/method, researcher/research object and what counts as empirical material—in order to blur the boundaries between ontology and epistemology and to encourage creativity and experimentation in research practices (St. Pierre, 2021; Gherardi, 2019).

This posture opens up a path to an exploration of a plurality of practices within or between disciplinary areas, as well as other types of engagement such as activism inside and outside academia.

The arts and aesthetic learning processes are one such area of experimentation and it is in this framework that our workshop is anchored (Coleman et al., 2019). There is no fixed definition of what an aesthetic learning process is, but it is generally considered addressing sensorial and embodied knowledge (Burman, 2014; Styrke, 2015). It has been argued that as aesthetic learning processes often engage the body,
creative expression and emotions in playful and open-ended ways, they can allow for meaning-making, personal appropriation and the exploration of a multiplicity of relations regarding any topic. Since the beginning of the twenty-first century, aesthetic learning processes have become more integrated as a specific subject area, especially in Swedish teacher training programmes. One practical example of this is the spread of “dance maths” experiences in Swedish primary schools (Burman, 2014). Another is the use of theatre and drama in higher education for sustainability, which it has been argued is a favourable tool for fostering engagement, communication and collaboration skills, and deepening understanding by enlivening facts and making them more accessible (Fries, 2015).

The workshop as an experiment and a methodology is specifically informed by creative dance, which it has been argued, is particularly well suited to exploring a variety of subjects at all educational levels.

With its origins in modern dance theory and practice, creative dance mobilises a conceptual framework for creative movement that was developed by the modern dance pioneer Rudolf Laban (1879–1958). It divides movement into components or analytical categories such as body, space, time and energy dynamics. Using one or a combination of these concepts makes it possible to decipher movement in different situations, and to design task-based movement explorations that anybody can do without previous dance experience. These tasks can open up the way to diverse and personal interpretations while also introducing tools for dance-making in an inclusive way.

Brehm and McNett (2008) write:

When using dance with other curricular areas, creative dance functions both as an art activity and as a learning tool (…) Movement can easily be connected to other curricular areas because everything—even a mountain—moves at some level. Movement patterns intrinsically characterise the phenomena that make up the world: relationships of growth, change, action and reaction (…). Experiencing curricula through creative dance combines movement on a larger scale with exploratory problem-solving and the creation of expressive forms. It also engages students’ feelings through attention to the kinesthetic sense. (Brehm & McNett, 2008: 64–65)
Because it uses creative dance, our initiative can be seen as an exploration of Barad’s idea that knowledge “does not come from standing at a distance and representing but rather from a direct material engagement with the world” (2007: 49, italics in the original text). This means engaging with the topic in more sensitive ways—through physical and sensorial explorations of the material world and its multiple entanglements, including our own bodies.

In this regard, albeit from a slightly different perspective, Myers (2012) has drawn attention to the role of bodily visualisations in scientific practice. Based on her study of biologists, she has given account of the movements scientists perform to lend support to the exploration of their objects of study, in particular protein synthesis. More than a way of representing the object, the body becomes an important medium for visualising proteins and performing and exploring their qualities. Myers shows how movement can serve to visualise and create embodied animations of processes such as the molecular pathways involved in protein synthesis as a dynamic process (Myers, 2012: 163–164). These embodied animations create affective and kinesthetic entanglements between practitioners and their empirical material (Myers, 2012: 170). In this sense, she argues, dance as a performative modality can be considered to be a form of knowing and an experimental inquiry into science (Myers, 2012: 162).

Workshop: Dancing Urban Waters

This study focuses on an arts-based workshop organised as part of a course on sustainability for first-year students taking the civil engineering programme in industrial management. The aim of this methodology is to explore different approaches to urban water management, in particular flooding. The workshop is participatory, employing educational strategies based on practical and creative activities as well as gameplay and the ludic dimension of learning (Coleman et al., 2019; Concina, 2019). Its other aims are to promote interpersonal exchange and collaboration in class, and to build bridges between the proposed topic and the students’ personal lives and lived experiences.
The workshop was developed to complement two lectures that Silvia had delivered previously as part of the same course. We conceived the workshop as a bodily experiment (Myers, 2012) in which students and teachers use their bodies as the medium “for articulating the forms, forces and energetics” (Myers, 2012: 156)—of floodwater in this case. Creative dance practice and theory (Brehm & McNett, 2008) supported us in the design of the dance activities by identifying the actions and processes, as well as the human and nonhuman actors, involved in urban water management when flooding occurs. We chose to focus on the coexistence of two paradigms for approaching flooding (Chocat et al., 2007): repelling water through “hard”, protective infrastructures (such as dykes) or being with water through more sustainable, “green” infrastructures (such as soil-based filtering devices)—with a focus on how water encounters and intra-acts (Barad, 2003) with the materialities involved in these different devices.

Methodologically speaking, the workshop was not intended to provide additional topic-specific information and facts, but rather to offer creative activities and group collaboration tasks that might potentially help students incorporate the topic content in new and different ways.

In the lectures, the students were first introduced to water management paradigms over time, from ancient times through “modern water” (Linton, 2010) to more recent approaches that adopt an inverse relationship with water—more inspired by a logic of “giving room to water” or “living with the risk”—and the reintegration of this element as part of the urban landscape. After the lectures, the students were invited to attend the arts-based workshop with the intention of letting them explore other ways of encountering urban water through participatory and embodied learning modalities.

As the class was quite large, three sessions were organised with about 20 students per session. Attendance was voluntary. Each session lasted 75 minutes and was organised as shown in Table 5.1.

The workshop was co-facilitated by Silvia and Henny, but each had slightly different roles.

Silvia was the main facilitator of phases 1 and 3—introducing the workshop, making the connections to the lectures and facilitating the final discussion—while Henny was the main facilitator of phase 2, which
involved guiding the movement and the creative tasks. During this phase, Silvia took part in the tasks together with the students.

We will now present how the workshop was structured (see Table 5.1) and describe the different parts of it in detail.

**Workshop Introduction**

The workshop opened with a summary of the key elements of the paradigmatic shift in water management from mastery only to “living with water”. This was followed by a transition to a contemporary case of flooding in a mid-sized Swedish city—Gandia—juxtaposed with historical examples of flooding (in Paris and the Loire Valley in France at the beginning of the twentieth century) to convey the idea of a long-term problem for European cities. The reference to a recent event in Sweden and its multiple consequences was meant to reduce the distance from the issue and facilitate a connection to a real case that most students recognised.

**Exploring and Performing Materialities and Coexisting Relations in the Flooded City**

The second part of the workshop was designed to offer (literal) immersion into the flooded city. Creative dance was used with the aim of engaging the kinesthetic sense to experience—in and through the body—some
physical qualities, movements, actions and processes that are present in the material reality of urban flooding.

Walking in Flooded Gandia—Becoming Bodies of Water

“Go on a walk. Feel your feet on the earth. Touch the breeze. Attend to impressions. Caress the thoughts that weigh on you as you amble. Feel the haptic; the corporeal.” (Springgay & Truman, 2018: 138)

As a gentle introduction to moving together while evoking a more sensorial attention on oneself and each other in space, the students were first guided to walk around the classroom while they imagined wading through water in flooded Gandia. Next, through guided improvisation, they physically explored being moved and pushed by water currents and then becoming water itself by bringing wavy movements to different body parts and flowing through space. As additional input for the experience, the students were reminded that 90% of our bodies is water, and they tried to see how they might move the liquid around in their bodies to create a loose, floating feeling of movement.

Protecting & Blocking: Water Encountering Hard Infrastructures

In contrast to the previous exercise, the next stage was to explore the process of becoming concrete by tensing the muscles and hardening the body into rigid, strong, dense and resistant shapes. This exercise made the transition into exploring water encountering hard infrastructures.

Figure 5.1 shows half the group “building” a defence infrastructure by connecting their hard shapes together as a barrier. The other half was given the task of trying to “flood the space” as water by finding different pathways through the barrier. This became a way of experiencing the idea that protective infrastructures might also be vulnerable, as water might leak through holes, flood over the top of the barrier or prove stronger than that, as we noticed when the water-students put pressure on their classmates.
The students were then invited to work in pairs on water-soil relationships, taking some descriptive words which we provided as their inspiration (such as absorbing/being absorbed and receiving/being received). The task was to create a gesture for each element and to express an encounter between them. The students then performed these encounters before the rest of the class, which displayed an interesting range of images related to water-soil relationships—such as embracing each other or hands melting into each other (Figs. 5.2 and 5.3), or soil lying on its back on the floor opening its arms to water, or water jumping on soil’s back, to mention just a few of the ideas. We also tried out each other’s proposals. Another interesting interpretation was a student floating in space with eyes closed, as blind water flows.
Elements of a Posthumanist Research Agenda for Education in Sustainability

In this section, we will report on some of the feedback on the conclusion of the workshop and later on in the context of the course evaluation and as part of the course assignments. These elements may provide some areas for a research agenda on sustainability in education informed by posthumanism.

Multiplying the Ways of Learning

After the dancing phase of the workshop, we asked the students to brain-storm in small groups and to spontaneously associate words with the experience on sheets of paper (Tables 5.2 and 5.3).

When we then asked them to report what they had been discussing, many of the students used the words *fun* (“fun way of learning!”) and
Fig. 5.3  Water/soil gestures (copyright Silvia Bruzzone)

Table 5.2  Feedback from Group 1

<table>
<thead>
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<th>Good</th>
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<tbody>
<tr>
<td>Fluid</td>
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<tr>
<td>Experience</td>
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<tr>
<td>Kunskap [Knowledge]</td>
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<tr>
<td>Fakta [Facts]</td>
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<tr>
<td>Rörelse [Movement]</td>
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<tr>
<td>Kommunikation [Communication]</td>
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<td>Roligt [Funny]</td>
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<td>Skojigt [Amusing]</td>
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creative to describe the workshop and their experience of it. Other comments were refreshing, refreshing like water and nice not to be in a lecture, which suggests that the workshop was experienced as something different (from a lecture) in a positive way. This became evident when a student who had already participated in one workshop expressed a desire to take part in a second workshop (which he did).

The following quotes from other students relate to both the fun and the importance of experiencing content in more holistic ways, as shown in our previous point:

“One thing I want to point out is the different kinds of how the teachers chose to educate us. I thought it was fun to have the “dance lesson” and it was a new kind of teaching and learning for me. It was different interacting with different parts of the body and not only the brain”.

“It was really refreshing and unexpected”.

“It gave a new perspective on sustainability”.

What was particularly valued about the experience was that it gave the students a chance to make the topic seem less abstract compared to traditional lectures. In the next quote, a student underlines the fact that visualising the phenomena brought about a better understanding of them:

“It was easier to understand because you see it in front of you in a different way from just listening in a lecture”.

In another case, the dance and the playful approach of the workshop were viewed as a way to make the phenomenon being studied —water and water dynamics in cities—a “reality”, something that becomes tangible or more concrete as an immersion in how cities are structured:
“In workshop 2, we got to learn about how different elements in nature react to one another and how the infrastructure is reliant on that. Through dancing and games it became a reality and that’s actually how most streets and cities are structured”.

Similarly, another student noted that exploring elements such as water, soil and cement and their relationships with the students’ bodies is a way of improving our understanding of the processes of re-integrating the water element into the urban landscape.

“During workshop 2 another medium was used for the purpose of education which was physical movement and dancing. The purpose of this education was to understand the benefits of using living materials in modern city infrastructure, such as walls, roofs, floors and everything construction related. The information could very well have been taught through a traditional lecture with a presentation. But by using our own bodies to become different elements like dirt, cement and water, the information taught was more memorable and created a better understanding of what building with living materials means”.

Another issue that was raised was how the workshop fostered a more personal connection to the topic: after the workshop, one student came to us to share enthusiastically that he had recognised in the workshop what he experienced in his work. He had a construction company that was doing some work in the area around the university, and the workshop resonated with his experience of how he dealt with water and cement professionally.

The experience of the more personal connection to the topic was not always an easy one, however. One student, while appreciating the experience, expressed a sense of discomfort at using his body in the framework of academic learning:

“Workshop 2 was special and I felt very uncomfortable during the exercises. It does not match my personality. But the workshop gave a different perspective and was interesting in that way”.

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In another case, using the body and having fun was associated with learning methods used with and for children and it was therefore considered to be inappropriate for educating adults.

Another facet of multiplying ways of learning relates to the different interactions with the teachers (especially Silvia in her capacity as the course responsible) being physically involved together with the students—jumping over defence infrastructures or squeezing through breaches in dams, for example. This put both the students and the teacher in an unusual position compared to what is commonly found in a formal academic environment, which is often characterised by a separation between students and teachers and where even the organisation of the physical space marks hierarchical differences. During the workshop, after some initial hesitation (when Henny invited Silvia to perform a certain task, one student reacted “But she is our teacher…!”), the students very quickly accepted the fact that Silvia was one of the participants—touching and being touched, pushing, running and flooding together with the students.

Moving/Becoming with Materialities as Empathic Learning

After the workshop, before leaving the classroom, a young male student came up to us and said “Thanks for the dance, it was fun. What an experience!” (“Tack för dansen, det var kul. Vilken inlevelse!”).

The Swedish word “inlevelse” is difficult to translate; it actually means something between feeling, presence and empathy—like being really present in (living in) something with your whole self. It is connected to the word empathy in the sense that the Swedish expression “leva sig in i” another person’s situation means to empathise, identify oneself with or imagine the situation of that person.

We believe that it is significant that the student repeated this word several times, as it actually touched the aim of the workshop, which was to use imagery and movement to physically move with materialities and processes involved in urban flooding.
Myers argues that embodied animations—such as those that were explored and performed in this workshop—are intra-active (Barad, 2003) and participatory in the sense that they invite moving with and being moved by (Myers, 2006, 2012) the object of study, as in being affectively entangled with the phenomenon. This seems to have been the case for the student who described his experience of the workshop with the Swedish word “inlevelse”. Interestingly, as Tables 5.2 and 5.3 also show, the students easily turned to their first language, Swedish, to describe their own experience or to express their emotions connected to the workshop without mediating them through another language, English.

In a similar sense, in the quote below, a student explains how the workshop made her experience different qualities, in particular the strength of the different elements, by entering into a relationship with them. The fact that she experienced the force of the elements by performing them also had an empowering effect on her, in that it allowed her to discover her own strength as a person.

“The workshop made me realise how strong elements can be. But as an ‘element’, it made me feel powerful as what I was made of. To be a wall is having power over something that does not have the capacity to reach over it, and the wind has its power and capacity over other elements. Every single element has its own power and capacity, which is how nature works and why it works. They have to be different and have different powers. To clarify, they are empowering in what they have over other elements, for instance. So after the workshop I understood my power as an ‘element’ and how empowering that felt”.

In this section, we have outlined some of the elements of a research agenda for posthumanist education on sustainability that emerged from the feedback the students provided in reaction to the workshop.

Firstly, creativity and fun are acknowledged as different ways of learning and are experienced as providing different perspectives on sustainability. Some students noted that they did not acquire new information on the topic at stake but approached it differently, which engaged them in more amusing, and even memorable, ways. More precisely, experiencing the phenomena with their bodies and collectively, or becoming with
them, allowed them to visualise the phenomena and make them become “real”, compared to traditional lectures, in which their student role is seen as being more passive. This enables a better understanding of the processes, as other authors have also emphasised (Myers, 2012).

Secondly, this pedagogical approach also has a specific moral posture. Experiencing with one’s own body is not just a way of understanding the topic better; it is also a means of experiencing being the other and becoming and moving with others. This draws attention to the role of empathy as a learning approach and as an ethical posture towards the topic at stake. Empathy becomes a way of learning about the world and oneself. This resonates with the specific ethical posture of posthumanism which does not rely on external principles but is rooted in the personal experience of moving with and becoming with the world.

Lastly, the experience is not neutral. As it involves students in a more direct and personal way, it can generate different kinds of emotions, such as discomfort or even resistance.

Dance as a Process for Creative, Embodied and Participative Learning in Sustainability in Higher Education

Linton (2010) reminds us that before modern times, water was seen as a multiple, mysterious and spiritual element. In the modern era, however, it has become something else. It is increasingly being associated with Anthropocenic processes in that it is acknowledged as quantifiable, measurable and knowable—the sum of chemical units. This reflects an engineering and managerial understanding of water that turns out to be fundamentally abstract, deterritorialised and placeless (Linton, 2010).

In our arts-based workshop, students were encouraged to acknowledge water, and floodwater in particular, in ways that differ from that view.

Moving on from that framework, we relied on creative dance practice (Brehm & McNett, 2008) to explore the multiple forms urban water takes when it becomes floodwater.
After attending lectures on emerging approaches in water management (from “control” to “giving more room to water”), first-year engineering students were invited to attend an arts-based workshop in which they were accompanied first on an exploration of a recently flooded city in Sweden by using their bodies and moving in the space. They were then invited to progressively act as floodwater encountering different materials, such as defensive infrastructures and filtering soils. This way of moving with a specific element connects with “walking methodologies” such as “thinking-in-movement” and “move-with thought” (Springgay & Truman, 2018) or “touch-walking” (Nätynki et al., 2023).

This approach is associated with a type of pedagogy that aims to go beyond a “problem-solving” understanding of engineering practice and to go into “problems” in a different, more critical manner. Students were invited to become bodies of water and to use a sense of curiosity and playfulness to explore materialities (water, concrete and soil) they might work with in their careers as civil engineers. This is so that they experience the different qualities of materialities in their multiple encounters: their strength, hardness, fluidity and vulnerability, and their unpredictability and blindness. This led them to other visions than the sense of mastery and separateness that has been a feature of modern water management, and opened up to new imaginaries.

As some students reported, the workshop made them “experience” the topic—urban flooding—which becomes easier to understand when it is visualised through their bodies. Experiencing the elements’ hardness, porosity and vulnerability in relation to other elements and their own bodies was also mentioned as being enriching and new. Exploring and visualising how we take part in complex, material networks with our own bodies, and are therefore not separated from our objects of study, is a way of practising the ethico-onto-epistemological position that we as humans are inseparable from the material world. In this sense, from a pedagogical point of view, “it is important to widen subjectivity by pointing out that humans are constantly becoming through new formations” (Bergstedt, 2017: 13–14. The translation is ours). In this workshop, we literally explored becoming through new relations, as reported by the student who described how exploring the force of different elements such as water put her in contact with her own strength.
This experience resonates with posthuman feminist scholars who have developed an understanding of water and society that differs from the engineering and managerial perception, and which is based on a watered sensibility. In particular, Neimanis (2013, 2017) has introduced the “body of water” as a specific configuration (Braidotti, 2011) that seeks to account for reality by overcoming a dualistic understanding of human bodily water and other ecological waters. Her proposition of a watered subjectivity is based on the acknowledged proximity between our watered bodies—90%—and other ecological waters. Water has specific properties both inside and outside our bodies (communicational, gestational, being multiple and unknowable) that we as watered beings share with other species and with other bodies of water (a river, a lake or an ocean).

“Waters (…) are too often relegated to the passive backdrop of our lives. Perhaps by imagining ourselves as irreducibly watery, as literally part of a global hydrocommons, we might locate new creative resources for engaging in more just and thoughtful relations with the myriad bodies of water with whom we share this planet”. (Neimanis, 2013: 28)

With her idea of “hydrologics in which our bodies partake”, Neimanis (2013) invites us to acknowledge a watered ontology and subjectivity with other species and places. This idea is grounded in critical material feminism and the “politics of location” (Rich, 1986; Braidotti, 2006; Neimanis, 2013) which acknowledges the implications of multiple and often contradictory locations of our subjectivity.

The workshop was an invitation to explore different hydrologics—of force, vulnerability, dissolution, memory and unknowability and multiple encounters in action—in the specific context of the city of Gandia.

From this experience, we have suggested a research agenda which first aims to expand learning practices and imaginaries connected to water—and post-Anthropocenic topics more broadly—beyond abstract and managerial understandings. It is an invitation to explore hydrologics with the body and the senses in creative and playful ways. The workshop suggests that methods from the arts might in fact be useful for expanding our sensitivity and multiplying the ways we see and experience connectedness with the world instead of separateness.
In this sense, the art education scholar Helene Illeris argues that Art Education for Sustainable Development has the potential to “embody pedagogy and ecology as open-ended, explorative, pragmatic and playful modes of being and acting.” (Illeris, 2017: 14, emphasis in the original). She stresses that rather than integrating ecology as thematic content, education should foster what she calls the ecological or posthuman person—meaning becoming a relational, embodied subject, interdependent and entangled with others in processes of constant transformation (Illeris, 2017).

This proposition also has political and ethical implications, as it is through the becoming-with other watery (and non-watery) elements that one can acknowledge the world and oneself by engaging more sensorial and empathic dimensions and by developing a capacity to respond.

Knowing water as an embodied element is also meant as a way to pass from an abstract understanding of the element to a more “workable” one—or a more “real” one, in the words of one student—aiming towards concrete positioning and response-ability. As Linton claims, water as an abstract concept is an “unworkable” concept (2010: 163) which, to using Haraway’s terms, refrains from taking any response-ability towards the water challenges of a specific place. “Disembodied and displaced, global water—again, in a version of Donna Haraway’s (1988) epistemological “God trick”¹—is everywhere and nowhere, and thus difficult to respond to with attunement, or curiosity” (Neimanis, 2017: 158).

The question is not what a posthuman arts-based practice is, but rather what this experience produces. We believe that the “body of water” and “watered subjectivity” as configurations can inspire an educational research agenda on water and sustainability, and in this regard, we have illustrated how posthuman feminist education combined with creative dance practice can support embodied explorations of urban waters.

These explorations are not neutral. As we saw throughout the workshop, they may generate positive and even enthusiastic reactions as well as resistance, vexation and confusion. These are not side effects, but rather

¹Donna Haraway introduced the idea of the “god trick” in her essay “Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective” (1988). It refers to the fact that “scientific truths” sometimes seem to originate from an observer standing outside the situated standpoint or values, as if there were an objective or impartial knowledge.
a way through which we build our own imaginaries of the world and situations in which we as teachers need to be able to listen and capable of responding.

Finally, the workshop as a methodology makes a contribution to the conversation on post-qualitative epistemologies in different ways. In the workshop, we challenged the bodily separation between teacher/student and researcher/research participants. During the experience, Henny and Silvia were both the facilitators of the situation and performers affected by the experience together with the students (instead of being external observers or mere instructors).

Moreover, by proposing an arts-based practice (instead of a method), we wanted to contribute to feminist posthumanism and post-qualitative research—which criticises representationalist research, which conceives the world as being ‘out there’ and research as being a representation capable of capturing that world (St. Pierre, 2021). It also invites us to blur the boundaries between theory and method and to think about methods not as neutral tools for applying theory, but rather as inventive (Lury & Wakeford, 2012), performative of the world (Law, Savage, & Ruppert, 2011) and politicised (Coleman et al., 2019).

In the case before us, “theory” may mean different things: the lenses we use to know water—the paradigms on water—but also the pedagogical perspective of how to learn about water, as well the posthumanist framework itself. So if we look at the relation between “theory” and “method” (to use a positivistic distinction) in our case, we can say that while the pre-established knowledge and “theories” about water guided us in the design of the workshop—the idea of “testing” two different water paradigms—the workshop (as a type of methodology) also contributed to generating other forms of knowledge connected to water, especially its multiple and relational qualities. The workshop also contributed to engendering ideas on pedagogical approaches we might use to explore water and processes of watered subjectivities, as well as how we can contribute to posthuman thinking on relationality, starting from the human and nonhuman entanglements of becoming urban floodwater specific to our context. In this sense, as Gherardi (2021) suggests, we are talking
about a posthumanist epistemology of research practice that recognises that knowledge happens in situated doings where practice becomes the unit of analysis as a form of being-knowing-doing.

References


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