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Learning to Navigate (in) the Anthropocene

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Abstract: Over the last decades, the extent of human impact on Earth and the atmosphere has been the subject of large-scale scientific investigations. It is increasingly argued that this impact is of a geologically-significant magnitude, to the extent that we have entered a new geological epoch—the Anthropocene. However, the field of Higher Education for Sustainable Development (HESD) research has been slow in engaging in the Anthropocene debates. This article addresses that research gap by offering a theoretical analysis of the role and position of HESD, and more particularly of the lecturer and the student, within the Anthropocene. At present, the majority of HESD research can be categorized as either instrumental or emancipatory. This article's central aim is to develop a third, navigational approach toward HESD research. In order to do so, the article first argues that developing understandings of the Anthropocene reconfigure traditional humanist conceptualizations of time, space and collectives. The article proceeds with advancing new, relational conceptualizations of educational spaces (as learning milieus), educational times (as rhythms that slow the present) and learning (as a situated activity that takes place through belonging). Embedded within these new conceptualizations, the proposed navigational approach aims to enable educational actors to orient themselves and to consequently navigate in, and to learn by making connections with, our more-than-human world.

Keywords: higher education for sustainable development; Anthropocene; science and technology studies; higher education; lecturers; time; space; learning; Stengers; Latour

1. Introduction

> *Summer, the end of another academic year. A couple of colleagues from all over the university are having a meeting of the Network for Sustainability Education, a recently launched initiative at the authors' university. During the network meeting, a professor in biology takes the word and begins a story about an educational activity he co-supervised. For this activity, students from the natural sciences were put together in an interdisciplinary manner. The students were asked to work on a project in which they had to develop ideas in order to make the shoreline of their country more sustainable. Talking about this activity to the Network, the professor makes clear that it took little effort for the students to start making plans for constructing a more sustainable future shoreline: full passion, they talked about reinforcing the country's dikes, about anchoring new data cables onto the seabed that should enable more sustainable communications, about improving architecture of the shoreline's apartments, and about yet a dozen other initiatives. Sharing this story with the Network, the professor makes clear that he was not exactly impressed with his students showcasing so much techno-optimism. "Whereas all that optimism is well-meant", he says, "it is rather unreflexive and not fully thought-out. I mean, of course they offer technological solutions—they're natural scientists, after all. So I asked them: What about the life under water? What about these apartments? What*

do they do to coastal life and how do they shape what it is to live at the country's coast? What about installing data cables that we will probably never be able to clean up in the future? Doesn't all that deserve to be taken into account as well?"

The research field of Higher Education for Sustainable Development (HESD) aims to devise approaches and viewpoints towards academic teaching that address contemporary sustainability issues, such as the current and future state of a country's shoreline [1–3]. HESD research is gaining traction and adoption in the broader field of environmental educational research [4,5]. In general, two large approaches towards HESD can be discerned: an instrumental and emancipatory approach. For one, the instrumental approach towards HESD seeks to instill particular sets of knowledge, skills, and attitudes in students in order to tackle the increasing complexity of sustainability issues (such as climate change, shoreline erosion, or interspecies living at the seaside) and the uncertainty associated with these issues [6,7]. Higher education is, in that respect, often considered the place par excellence to develop and enhance necessary competences of students: by means of the close intertwinement of research and teaching, higher education is able to offer the newest insights to students, and to train them in the ability to propose answers to (or even solve) contemporary and future sustainability problems [8,9]. Currently, research on HESD has identified crucial competences which are necessary in order to solve such challenges: systems thinking, anticipatory, normative, action-oriented, and interpersonal competences are increasingly considered interdisciplinary bundles that, when equipped correctly, will allow future generations to deal with our present-day problems [6,10,11].

However, within HESD research, a second emancipatory approach contends that whilst instrumentalism definitely has its place in acting upon and formulating responses to sustainability issues, education is not the place par excellence in order to do so, e.g., [2,12]. According to this approach, instrumentalism largely conceives of sustainability as a delineated end-goal, and of education as an instrument that allows one to instruct or convince students to behave (and think) as deemed appropriate [13]. The corollary of such reasoning, it is argued, is the imposition of pre-identified (and often seemingly simple) solutions to very complex problems, which might quickly end up in an 'eco-totalitarian' form of education that seeks to produce "diligent, disciplined and complacent" students and citizens [12] (p. 10). In contrast herewith, the emancipatory approach starts from a perspective on education that aims for students to become active, critical, and responsible citizens that are capable of acting in today's world, as well as the future's [14]. Instead of positioning HESD as a problem solver, the emancipatory approach conceives of sustainability as continuously emerging. More particularly, higher education is considered as a field that should offer opportunities for a deeply engaging form of learning (and education) that has no pre-defined end goal, but that is rather seeking to foster the critical and transformative capabilities of the individual learner [8]. As such, the emancipatory approach is not interested in offering clear-cut solutions that would make a contribution to singular problems. Rather, it aims to "enable students to become critically aware of how they perceive the world with a view on fostering citizen engagement with social and environmental issues and participation in decision-making processes" [15] (p. 7).

But how to characterize the comment of the lecturer as described in the vignette above (which is based on the notes we made when attending this meeting at our university) into one of these instrumental or emancipatory approaches? In this vignette, the lecturer is not particularly aiming to offer his students one-time solutions or instill generic competences in these students, and neither is he explicitly attempting to foster citizen engagement or enhance student participation. Instead, over and beyond these two approaches, the lecturer seems to suggest that *there is something more important*: something that insists, but that is nevertheless not yet taken up by the students themselves. In this article, in accordance with recent literature and particularly drawing on the later works of Isabelle Stengers and Bruno Latour, we argue that addressing this insistence (this 'something more important') of concrete practices, and what these practices oblige us to take into account and require from us, is a crucial task of HESD, a task that is at present not yet sufficiently theoretically grounded [16–18]. More particularly, we argue that addressing this 'something more important' requires an approach to

HESD research that is neither instrumental (focused on problem-solving) nor emancipatory (focused on individual transformation), but that rather focuses on the situated and entangled being of both human and non-human actors in specific, designated places [19]. We call this third approach a *navigational* approach, since its primary aim is to teach educational actors (i.e., lecturers and students) to orient themselves and to consequently navigate in (and become able to compose a response to) these relational and profoundly entangled more-than-human spaces and times. In advancing this third, navigational approach, this article thus aims to contribute to the theoretical grounding of HESD research, and does so in relation to two parallel evolutions that are impacting our contemporary ways of living: the socio-geological characteristics of the Anthropocene on the one hand, and the increasing blurring of the human and the natural as concretely exemplified by Science and Technology Studies (STS) on the other hand. We start the following section by situating HESD research within these two bodies of literature. Then, we argue that anthropogenic processes have resulted in a reconfiguration of our modernist and humanist understandings of space, time, and collectives. In another section, we analyze the implications of these reconfigurations for HESD and propose different, relational understandings of educational spatialities, temporalities, and forms of learning. In line with these arguments, we conclude the article by offering some concrete implications of this navigational approach for the role and position of lecturers in HESD.

2. The Anthropocene

2.1. The Blurring of Distinctions between the Human and the Natural

The term Anthropocene is a relatively novel concept that has been circulating since the beginning of this century. It was only back in 2000 that Crutzen and Stoermer coined the term: "Considering these and many other major and still growing impacts of human activities on Earth and atmosphere, and at all, including global, scales, it seems to us more than appropriate to emphasize the central role of mankind in geology and ecology by proposing to use the term "Anthropocene" for the current geological epoch" [20] (p. 17). Even though the Anthropocene is not (yet) formally designated as a geological epoch by the International Commission on Stratigraphy, the term is at present generally adopted to stress that the impact of the human race on Earth is of geologically-significant magnitude, to the extent that the Holocene (the alleged previous geological epoch in which the human species emerged and developed) has been terminated by mankind itself [18]. Importantly, the Anthropocene should not be merely conceived in terms of a contemporary environmental crisis, but rather as a much more forceful socio-geological process that was *willfully* originated by human actions during the Industrial Revolution. This makes any interpretation that we somehow proceeded from a blind past (in which we didn't perceive the magnitude of the consequences of human action upon the Earth) to a lucid present (in which we suddenly have come to realize our devastating impact on the planet's ecosystems), fraught with immobilizing and anesthetizing thought [21,22]. Furthermore, the concept is largely invoked in order to point to the significance and urgency of our present constellation, in which the Earth system itself is being mobilized towards (and not only through) humanity. In this article, we adopt the term Anthropocene precisely to refer to these processes and phenomena, and to the associated urgency of finding new ways to inhabit this present-day (and future) epoch in which we perceive Earth no longer as the framework for human action, but precisely as participating in (and increasingly partaking in the configuring of) that action [23] (p. 42).

However, the concept 'Anthropocene' itself is not without dispute, as the usage of the term 'Anthropos' implies a unification of humanity as a species and consequently seems to suggest that responsibility is evenly and universally distributed across our species as a whole [24,25]. Likewise, the term situates the actions that need to be taken equally and quasi-exclusively within the human realm, as such reinstating a humanism that is deemed to be largely responsible for the ecological crisis in which we find ourselves today [26]. Indeed, it has been suggested that the term perpetuates and validates the circularity of human exemptionalism, i.e., that *more* human interventions and solutions will somehow

enable the fixing of the mess created by humans in the first place [17,27]. Another point of dispute is the proposed starting point for this new geological epoch, ranging from somewhere around the start of the Holocene to the last couple of decades (closely tied to the Great Acceleration of the 1950s). Yet, despite these critical remarks, the fact that anthropogenic processes have resulted in effects on the planet is—at least in scientific circles—no longer in question [28,29]. The Anthropocene is thus both "our epoch and our condition"; a "sign of our power, but also of our impotence" [21] (p. 11). Pointing to the sociomaterial terraforming of our planet, it denotes issues of scale (global planetary processes marked and only experienced by local phenomena), speed (greatly accelerating), synchronicity (the synchronization of the fate of a manifold of species with each other), and complexity (the entanglement of different, natural, and cultural processes) [30].

If we can only make sense of the Anthropocene by taking into account its scalar, velocious, synchronous, and complex dimensions, an approach is needed that starts from the inseparability of natural and cultural processes, precisely because "the wall between human and natural history has been breached" [25] (p. 221)—see equally [18,23,31]. This especially applies to the field of HESD research, in which both the instrumental and the emancipatory approach tend to conceive of students as active individual agents who are deemed to undertake actions that will address and/or transform sustainability issues [32]. Put differently, when considered as a concrete manifestation of the enmeshment of the human and the natural, the Anthropocene necessitates an abandonment of classical truisms that man acts upon a mute, passive, and objective nature—and concomitant beliefs that HESD should be conceived as an instrument that can be deployed in order to develop in a more sustainable manner or to transform students into better environmental stewards [17]. The abject condition of life on Earth in the Anthropocene has precisely been partly instated by making severe distinctions between elements that in practice all belong to a singular, 'patchy' landscape [33]. As such, the Anthropocene can equally be perceived as constituting a crisis in our traditional, modern ways of thinking [22,34]. Next to other neighboring fields such as critical posthumanism, (new materialist) feminism, and speculative realism, it is especially the broad tradition of STS that has extensively analyzed, criticized and offered ways out of these modern ways of thinking, both within as well as far beyond the field of HESD research.

The STS tradition is heterogeneous and diverse, but has as one of its general characteristics that it studies situated, sociomaterial practices as they are in the process of being 'in the making' [35]. The central contention of STS in this respect is that traditional dualistic bifurcations between nature and culture, science and society, facts and values, materiality and sociality, etc., are typically modern fabrications that seek to serve (and enact) a highly particular, humanistic worldview that places humanity at the center of the universe and that makes Anthropos the measure of all things [36,37]. Such bifurcations are emblematic for what Latour [38] has termed the Modern Constitution: a worldview that not only demarcates the world in stringently separated collectors, but that is equally characterized by a mystification of the practices and operations of science, which is the only modern institution able of trespassing the fissure between the human and the natural collector (and building bridges between them).

STS approaches are generally highly critical of this modern worldview because it neglects—and even obfuscates—the situatedness and complex entanglements characteristic of any mode of being [39]. Instead, STS not so much decenters the human aspects of any action as it resituates agency as a collective, patchy, achievement of assemblages of a variety of sociomaterial actors. However, it is not the aim of this article to make a case for the general importance and relevance of STS approaches for HESD research, as this has already been discussed elsewhere, e.g., [40–44]. Rather, this article draws upon specific insights generated by these approaches in order to conceptualize (and become responsive to) some of the challenges that HESD research is confronted with in the era of the Anthropocene. This is important, given that the field of HESD research has been relatively slow in engaging in the Anthropocene debates and how this Anthropocene has the potential to affect core beliefs and approaches of different HESD actors [17,18,34]. As such, the article aims to address the challenge of

moving contemporary HESD scholarship beyond well-meant, yet profoundly humanistic notions of students as the prospective stewards of the planet (shaping and molding this planet towards more sustainable ends) and of lecturers as the agents who lead students towards such stewardship [17].

It is against the backdrop of these research gaps and recently emerging ways of thinking that this article develops a theoretical analysis and grounding of HESD practices that puts the Anthropocenic condition (rather than problem-solving or individual emancipation) center-stage. Importantly, this article seeks to address a research gap present in the HESD literature, and is as such not making any inference about contemporary HESD practices. Positioned within the STS field, this theoretical grounding should be approached in a minor key; that is, its aim is not to inform evaluative judgements about actual educational practices or to invoke grand categories or maxims that are expected to stand central in each and every HESD practice. Rather, the aim of our minor-key analysis is to provide a heuristics that, in operating as a *sensitizing device*, should enable researchers to conceive of and situate complexity and uncertainty within HESD practices, and that in doing so shifts attention away from human agency alone [35,45]. Put differently, rather than offering prescriptive maxims, our purpose is to offer minor concepts that do not have the intention to function as expert knowledge, but that rather are multidirectional and generative. These minor concepts aim to bring care and attention to the situated and entangled being of human and non-human actors, and they could and should be put to the test of relevance by particular situations and in concrete HESD practices [45–47]. As a starting point of this minor-key analysis, we now proceed to outline how the blurring of distinctions, characteristic of the Anthropocene, is presently reconfiguring the spatial territory, the temporal horizon, and the composition of the collectivities in which HESD practices are embedded.

2.2. Anthropocenic Reconfigurations of Space, Time, and Collectives

In line with the viewpoint that modern bifurcations are being short-circuited by Anthropocenic entanglements and configurations, STS scholars have recently argued that concomitant modern understandings of temporality, spatiality, and what it means to be part of collective life are being jeopardized. Put differently, the Anthropocene marks the dawn of a period in which changes in *degree* become changes in *kind* [48] (p. 159). In this section, we argue that such changes and reconfigurations are very poignant for the way we understand and approach HESD. First, as far as space is concerned, it has been suggested that the Anthropocene is gradually depriving us of what could be called common ground: once Earth itself is being mobilized and beginning to take part in the functioning of society, the classical notion of territory, as something that we all unquestionably share with one another, is radically reconfigured [49]. As Latour [50] (pp. 1–2) puts it: instead of being the décor of human history, Earth is now active on stage and participating in public life. For instance, shoreline erosion is not simply a matter of a natural phenomenon of sand sliding into sea. Rather, over and above the technical aspect of the coastal municipalities having to constantly restore thousands of cubic meters of beach, storm after storm, year after year, the very social and political question of *what to do with, and in the presence of, the shore's space* comes pertinently to the fore [51]. Thus, when natural processes and phenomena start to have an influence on (and intermingle with) politics, economics, and other traditional human areas, as a consequence our traditional notion of space is changing: we can no longer act as if there is one singular world, in its metaphysical and modern sense, i.e., as the neutral, unifying, and objective spatial backdrop of the actions we daily undertake [18,25,49]. Put differently, instead of being confronted with one singular world, we are presently confronted with the task to compose a variety of *worlds* (such as the world of sea life, the world of communication, the world of sand, and the world of municipal politics) in order for these worlds to be habitable [23]. Rather than assuming a singular global world in which a plurality of associated localities are situated, HESD practices are thus confronted with new sorts of spaces. These spaces incorporate regional and Earthly dimensions [23]: these zones or regions (not the ocean, but *this specific piece of shore*) that students are entangled with, and that have little to do with the universality of nature (Planet Earth) advanced by modernism, but

that nevertheless relationally connect with the larger world (e.g., climate change causing sea level rise; general country governance impacting specific shoreline erosion measures).

Secondly, and closely related to this reconfiguration of space, is a reconfiguration of time. The traditional modern understanding of time comprises the conviction that time is something that endures, proceeds in discrete moments and flows in a straight line: in a modern point of view, the future appears as a discrete entity which is separated from the present and which can nevertheless be acted upon already in this present, because it is conceived as *something to progress towards* [52]. Yet, in the Anthropocene this traditional 'arrow of time' no longer holds and is getting bent in various directions. Which (viable) directions to take should HESD present? Which future should HESD portray for future shorelines? And what is, in that respect, the most sustainable thing to do? In sum, how—and to what end—to educate? Within HESD research, the answers to these questions are no longer clear-cut [12]. Put differently, conversions characteristic of the Anthropocene place us in a world without distinct teleology where the (logic of) modernist dreams of a horizon to progress towards has stopped to make sense: the idea of progress, with associated categories and assumptions of growth and improvement, is no longer persuasive on its own terms [Stengers in 30]. Instead, we are enmeshed in a timescape of indeterminacy, in which the modern promise of stability and progress has ceased to make sense. Put another way, the blurring of distinctions within the Anthropocene necessitates theoretically reconceptualizing what it means to become sensible for other (at once educational and sustainable) temporalities [33,50].

In addition to these major spatiotemporal rearrangements and reconfigurations, our traditional understanding of what it is to be and form a collective nowadays, is equally being challenged. Reflecting the STS tenet to question the analytical separation between the human and the material world [53], the Anthropocene elucidates in practice that humans are never the only entities to act, but that action always is, so to speak, a two-way street: just like Earth is beginning to participate in public life, humans themselves are becoming imbricated in the constitution of Earth's geology. If the social and the material/natural are so intimately and intrinsically entangled, issues pertaining to the collectivity of public life (e.g., Who is involved and should have a say in composing this specific piece of shore? To what extent does underwater life need to have a voice?) are becoming questions to answer, instead of being more or less self-evident. What is being rendered more and more clear is not only that these questions are increasingly difficult to answer by appealing to some sort of modern universalism (i.e., humanism), but equally that we are definitely not the only ones shaping and acting upon the world. There is a manifold of other entities knocking at the door of collective life, partaking in the reshaping of our territory and the enactment of new temporalities. Consequently, the humanist belief that HESD projects should be about teaching students to become (or transform into) effective environmental stewards that will be able to effectively and unidirectionally act upon and transform the natural world, is rendered increasingly incompatible with Anthropocenic evolutions themselves [17].

In sum, the blurring of distinctions brought about by the Anthropocene reconfigures many things we know and are familiar with: our sense of place (no longer one singular global world, but rather a plurality of worlds), our sense of time (no longer something that naturally improves and/or progresses, but rather something indeterminant and precarious), and even our sense of who we are as a collective (no longer humans who can/should steward the planet, but rather an entangled collective of active human and non-human actors) [23]. Unsurprisingly then, in this new constellation modern conceptions of HESD are finding themselves on shaky grounds [54,55]. How can we provide new generations of students the tools in order to build a particular type of future if we do not (and cannot) know which direction this future will take? Which tools are apt when there is no longer any predefined or desired end point? How to (learn to) inhabit this new Earthly territory? If—as we argued above—the present constellation cannot be addressed by the same means as the ones that created the current situation (e.g., human stewardship), what are the tasks and responsibilities of HESD practices that seek to become attuned to and deal with the complexities of the Anthropocene? It is important to again stress here that it is not our intention to evaluate any current HESD practice. Rather, what we aim to

show is that the Anthropocene forces us to think and act differently about educational spaces, times and collectives, and, in doing so, act beyond the traditional tropes of globalism-localism, progress, stewardship, or individual emancipation.

3. HESD in the Anthropocene

3.1. The Learning Milieu as Educational Space

In order to characterize the sort of spaces in which HESD practices that address Anthropocenic conditions are situated and in which learning can take place, we propose the concept *learning milieu* [16]. Importantly, we assign some specificity to this learning milieu, that is, we are specifically talking about the learning milieu of practices in the field of *higher education* as it takes place in universities where the classical academic functions of teaching, research, and service are (at least ideally) tightly interwoven [56,57]. In this sense, sustainability learning in universities is always the result of a combination of some of these three functions (e.g., learning about research or by researching oneself; researching in order to learn about something and/or in order to provide a service to society; . . .) [58]. For HESD, it is crucial to see the close interconnectedness between these functions and not let one function prevail over the others; for instance by letting education and teaching merely be the derivate of research activities, or the other way around; that is, by letting the research agenda exclusively be set by educational requirements [34]. For the purposes of our argument, we do not make a division in importance between the three activities here, but rather posit that the university's three tasks are all part of the learning milieu.

With these specifications in mind, we adopt the term milieu, since this term nicely conveys and operationalizes the idea that students and lecturers themselves are not to be situated *on* the world (as if they are learning from behind the scenes, watching from the décor as the spectacle unfolds) but are rather always *part of* the Earthly [50]. This stresses the importance of creating conditions in HESD in which one is stimulated to learn to navigate within the various Earthly entanglements of human and non-human actors. Thus, the learning milieu is concerned with all that is of relevance given a particular subject matter and within a particular area (fish, scallops, sand, architecture, dikes, ways of living together, the economy, fishermen, . . .), or what we could call with Latour [50] regions or critical zones: pieces or fragments of Earth to which students can relate or feel attached to. These regions or zones do not need to be understood here in the sense of small, but rather in the sense of being opposed to generality or universality (*this* shoreline and not another), since universality might easily have the effect of anesthetizing students and lecturers [16]. Additionally, it is important not to equivocate the term learning milieu with an uncritical understanding of the term learning environment, which is a concept largely bequeathed with humanist assumptions. From this perspective, and in contrast with the traditional understanding of a learning environment, the learning milieu is "not constructed *by* humans and *for* humans to apprehend, but is rather constituted *through* the complex relations between entities in a collective field of engagement" [18] (p. 145). A learning milieu, thus, is entirely relational and as such not about sand and dikes but rather, and first and foremost, about the *relations* between them. It is not a thing in itself, but rather an assemblage of relations that can overlap with other milieus, and that provides the space in (and about) which students (and lecturers) potentially learn within HESD practices. In that regard, it is of importance to stress that we use the term milieu in the double French sense of the word here, i.e., both in terms of the middle and the surroundings [46].

First, the learning milieu as middle signifies that what one learns about should be conceived without reference to a particular principle or a certain projected ideal. Operating as middle, the learning milieu has no ideal (or universal) horizon in mind, precisely because (as we stated above) this horizon is no longer knowable. If we have no idea what the future is going to look like, HESD can no longer progress towards a projected ideal or aim—and neither can it be grounded in teaching any sort of romanticized (or regressive) ideal. Rather, learning and teaching within HESD have to take place in the middle of things, that is, in the here-and-now, in our present zonal ecological constellation (and in

the full realization of—and responsibility for—the potential consequences of present and future ways of acting) [12]. Thus, learning and teaching in the middle of things is not exclusively directed at the present. Rather, the learning and teaching that emerge in this present enhance the ability to make thought creative in view of futures that are different from the ones that present themselves as obvious or necessary, based as these are on modernist assumptions of growth and progress.

In that respect, and secondly, learning through the surroundings means that the topic of learning and teaching is never separated from the milieu that is required in order for it to exist [46]. That is, sustainability issues that are being addressed within a learning milieu do not have the function of merely being a case of or an instance of (e.g., of coastal erosion), for such an approach has the general aim of lifting these issues out of their surroundings (it is no longer about *this* shoreline). Learning through the surroundings thus requires one to stay with the trouble, as Haraway [30] would call it: not to transcend the particular (or trying to explain it away) by invoking general theoretical explanations, but rather embedding the particular within its situated ecologies. As we will argue in what follows, this implies to remain attentive to (and in the presence of) the matter at hand—and this without having to subsume the particular or transcending it into something universal. Put differently, learning through the surroundings is precisely a matter of establishing care and attention (and hence, an attachment) for the regional or zonal, for it is precisely the detached posture of the objective and generalizing observer that is partly responsible for the Anthropocenic condition in which Earth and its multispecies inhabitants are finding themselves today [27].

In sum, in this section we conceived of HESD spaces as learning milieus: spaces that are first and foremost characterized by their relational entanglements, and that seek to take into account *all* human and non-human actors that are of importance for a particular region. The concept milieu stresses at once that what is done in the here-and-now always has consequences for the future of this particular region (and, consequently, of what happens on and with the Earth). As such, being attentive for this here-and-now highlights an educational process in which students become *attached* or *affected*, since it is very difficult to attach oneself to or become affected by the universal.

3.2. Temporal Rhythms Slowing Down the Present

The learning milieu, as a characterization of the type of HESD spaces in which one learns to navigate the Anthropocene, is not to be conceived in a standalone manner. Rather, a learning milieu is always connected to specific temporalities, and to variations present within such temporalities: HESD practices are always enmeshed in various *rhythms* which are co-constitutive of the unfolding of these practices [59,60]. With the term rhythms, we point to an approaching of time as being something multiple, rather than as something being singularly defined by the modernist idea of progress. Hence, analyzing temporalities in terms of rhythms allows to envision alternative experiences of time that allow one to learn and to navigate within these aforementioned learning milieus [59]. If the traditional modern temporal horizon, which imbues temporality with the idea of a strictly linear course of progression, is being short-circuited within the Anthropocene, what sorts of temporal rhythms do (or could) come to the fore within HESD practices? How to learn to live in such conditions of radical uncertainty [18]? Together with Stengers, we tie the enactment of HESD rhythms to the specific activity of "the resisting of habit" [46] (p. 185). That is to say, we argue that the continual resisting of habits constitutes rhythms by means of which one becomes sensitive for all actors present within a milieu. Habits amount to a routinization of behavior, and thus to a repetition of what is already in place: stronger dikes, better cables, less apartments. Yet, and as argued above, HESD practices can precisely *not* count on habitual ways of thinking or courses of action, and need to develop new avenues for action that resist appropriation and/or re-enactment of established ways of acting, doing and being. Taking the zonal character of learning milieus seriously implies the recognition that each milieu requires specific measures, specific sorts of care, or more broadly specific rhythmic ways of *thinking with* this milieu. What is needed then, is a focus on the ecological situatedness of practices where what is at stake is "giving to the situation the power to make us think" (ibid.). This amounts to

the creation of rhythms that allow students *and* lecturers to become affected by what is taking place within this milieu and that, thus, allow these educational actors to learn without having to directly or necessarily assume that this milieu would be in need of improvement.

Taking this argument one step further, what is at stake in HESD can then be designated as the creation of practices that establish a learning milieu in which students are learning how to think *in the presence of* a particular situation. This necessitates attention and care and obliges these students—to return to our example—to equally take into account 'what is more important'. The enactment of such practices not only necessitates that lecturers seek to create and bring about specific forms of learning (cf. below), it equally requires that they make these practices and their constituent actors fully present; that is, that they seek for ways in which to draw actors and their interrelations within the learning milieu and to make them into a matter of study and care. Thinking in the presence of (the relations between) actors in the learning milieu is no easy feat: it requires one to become attentive to dikes *and* political actors *and* apartments *and* scallops *and* fish *and* data cables *and* the local economy *and* how all of these actors are related to one another. This, thus, unavoidably implies that at the moment one starts to think in the presence of actors of a learning milieu, one cannot be but hesitant and careful in view of the question what the criteria of relevance are to make someone or something present [38]. Making something present is then about the enactment of rhythmic temporalities that *slow down* the present and that, thereby, enable attention [61]. This is precisely the effect of the intervention of the lecturer: by asking these questions, which urge students to think in the presence of *each* actor that is of importance, the students' thinking is at once slowed down and directed at an attentive relation with the entire shoreline. It has been argued that such slowing down is a typical rhythmic qualification of educational practices more generally, because the very act of studying requires that one devotes time to the matter at hand [62]. Yet, within HESD, this slowing down always has a *compositional finality*. That is to say, the slowing down that takes place in the learning milieu is not only effectuated in order to make something present (and to, for instance, describe what is being made present), it is equally effectuated in order to recompose what is being made present [63]. This focus on composition implies that HESD should not be directed at zones as they are (and trying to describe those as objectively as possible), but rather as what they might become [46]. The temporal rhythm of slowing down, thus, is immediately tied to an opening up of the future, yet without re-invoking the master narratives of prediction or progress. Rather, this future orientation is about learning what practices demand, thinking through what is happening in the present, what affects different social and material actors in a particular practice, and formulating propositions in order to compose a possible future world where all these various actors can prosper [23]. As such, all this implies the enactment of rhythms that, as our example so nicely shows, seek to lure students into being attentive to the future through the present. Being attentive to the future through rhythms that slow down the present is a matter of populating students' imagination, that is, of enabling them to recount how practices could potentially be transformed with respect for their situated ecologies [16,26,64].

In sum, in this section we argued that learning to navigate different learning milieus is closely tied to the enactment of specific temporal rhythms. When HESD practices aim to become sensitive for and take into account as many (relations between) actors present within this milieu, the rhythms of educational activities are not characterized by the continuation of the habitual or what we are familiar with. Rather, thinking in the presence of these actors, and seeking to recompose practices so that they are more inclusive in terms of who and what can prosper, necessitates that one slows down established ways of doing things and turns these things into a matter of educational and compositional concern. As we will argue in the next section, within HESD this is not so much a matter of coming up with singular solutions as it is matter of thoughtful and attentive learning and experimentation.

3.3. Learning through Belonging

When HESD practices aim to move beyond a humanistic idea of planetary stewardship, HESD lecturers should not consider natural practices (or the planet as a whole) as weak, in need of sustaining,

and our individual behavior correspondingly in need of transformation. HESD should not be directed at learning students to become the instruments that are either able to solve environmental problems or to emancipate themselves (in order to solve these problems), for what both approaches have in common is that they continue to assume that humans are the privileged and uniquely capable persons able to steward the globe and/or its constituent practices. Thus, both approaches operate under the presupposition of some sort of encompassing universality (the planet, the global, nature). From the point of view we advocate here, however, Anthropocenic conversions not only clearly show that such a universalist view on space no longer holds (see above), they equally show that navigating the Anthropocene is not about acting out of nowhere: there is no action that is not situated [22,30]. In other words, just like there is no unified nature that acts mutely and indifferently, there is equally no singular humanity acting as self-contained agent: despite the anthropogenic causes of climate change, humanity, as such, is not a self-aware actor capable of acting on its own [65].

In order to further stress this situatedness, and in accordance with the relocalization of the place of learning as the milieu and the reconfiguration of the time of learning as slowing and attentive rhythms, the notion learning itself equally needs reconsideration. As many advocates of HESD state, learning about sustainability issues is not solely about students' individual acquisition of knowledge, skills and/or attitudes, or about their individual emancipation (e.g., [12,14,40]). Rather, HESD learning should equally entail a collective dimension where students can see (and perceive) their own and practices' situatedness [63]. On the one hand, this situatedness can be found in associating the type of learning in HESD with what is often called systems thinking, where students are concretely learning to perceive the interrelatedness—and in that specific sense, the collectivity—of a system's constituent parts (e.g., between CO_2 emission, dikes, apartment buildings, and sea levels). On the other hand, it is equally often proclaimed that learning within HESD should be about learning to see and disentangle the consequences of human action on a collective level (e.g., the building of one or a couple of apartments probably does not have major impact, but filling the entire coastline with them has a devastating effect on the ecosystem). Both strands of reasoning have a common assumption: they consider students to be *parts of* a society that influences the natural system in particular ways. Yet, conceiving of students' learning likewise not only again reinforces the bifurcation between nature and society, it equally is "an easy way to produce an objective lowering of what [they] feel and think" [46] (p. 190), since such reasoning starts from the assumption that what students learn and claim is not their own genuine learning (that takes place in a designated zone and is in that sense profoundly situated), but only a part of general, overarching patterns that happen and take place irrespective of their own individual and collective acting.

In a situated worldview, conversely, humans are not to be conceived as being merely parts of society, just as scallops and fish are not to be conceived as being merely parts of nature: rather, different actors *belong to* different practices. That a certain actor belongs to a practice is not simply an observational or evaluative act: belonging requires active participation within a particular practice [66]. Belonging, thus, is a lot stronger than being part of something, since it is impossible to belong to a certain practice without knowing that you belong. This, on its turn, entails specific *obligations*: not everything one can do is equivalent, that is, of equal value [46]. Belonging to a certain practice thus requires that one is in the position to evaluate and judge what this practice needs in order to thrive and prosper, and thus, that certain actions, activities or convictions are more valuable than others. When lecturers address students as they belong, they address them in terms of what they are attached to: "attachments are what cause people (. . .) to feel and think, *to be able or to become able*" [46] (p. 191—our emphasis). Hence, from this perspective, one's ability is depending on the relational attachments one has within a particular situated practice that is centered around a particular matter of concern [38]. It is this precisely these attachments that the professor was hinting at when addressing the something more important: Are you only attached to technical ameliorations without grounding these ameliorations in the concrete situated practice of the shoreline? Are you not equally attached to what happens under water? Don't you care about sea life? Put differently, what the

professor made clear in his questions is that without attachment, there can be no autonomy, and consequently equally no thinking in the presence of the other actors part of the practice: "you think when you are forced or obliged to think" [46] (p. 191). In sum, and importantly, we argue here that HESD is not about defending practices. Instead of defending practices as if they are weak, it is crucial that HESD lecturers address students in terms of what they belong to: the different (critical) Earthly zones that they are situated in and are affected by, for instance in and through a particular course. Addressing students as belonging to the critical zone of a country's shoreline, for instance, addresses them as persons who have an obligation towards this shoreline, and who are—through the surroundings—consequently heavily entangled with all the different actors populating this shoreline.

This collective of actors that are part of a learning milieu is never predetermined and always part of what is at stake in HESD. Who is the we, that is, who are all the heterogeneous actors belonging to a particular milieu? This heterogeneity needs to be recognized and actively produced, for it is only in recognizing the multiplicity of actors in a particular milieu that one truly starts to belong to that milieu oneself [16]. Put differently, learning is a matter that is inherently tied to the collective or the we, both in terms of one's situatedness within collectives and in terms of the composition of future collectives. In order for such learning to take place, and through paying attention to what practices require, Earthly learning is not a matter of envisaging a clear-cut end or a set of learning outcomes. Rather, it is a matter of experimenting and making *connections*; that is, of description of the collective we and of composing an attentive relationship—what Tsing [33] calls the art of noticing—with the heterogeneity of this we that enables entanglements [23]. This necessarily implies making connections between presently isolated disciplines [18,67] (on the general importance of inter- and transdisciplinarity, see [68]). This act of composition, thus, is an act of learning to make such heterogeneity present *and* matter and, moreover, to prepare oneself to position oneself. Without having the intention to ameliorate or transform the collective—for this would again imply an unsituated stewardship—learning becomes a matter of learning to compose and to respond towards that what the practices one is situated in oblige one to think, do and feel [30,61].

Earthly learning, that is, learning that is situated through belonging to and being capable of navigating Earthly zones, is not only about learning to become more sensitive to the heterogeneity of the collective that is situated within a particular milieu, it can equally only take place when one understands the extent to which one is responsible for a particular practice [22]. Without an obligation towards, and a responsibility for, the shoreline in question, no Earthly learning can take place. Yet, from the moment one experiences this responsibility (i.e., that one is entangled with other actors in/at the shoreline, and that one's position as an attentive student precisely makes one responsible for this piece of shoreline), learning becomes a reactive matter of *affect*, in the double sense of taking into account all those different actors that are affected within a practice as well as allowing oneself to be affected by those differences. In other words, we use the term affect in a minor manner here, i.e., as becoming progressively more sensitive for differences. Within STS, "Learning to be affected means exactly that: the more you learn, the more differences exist" [69] (p. 213). Thus, through slowing down, in HESD one's own singular vision and position always and necessarily come into contact with that of others, and learning takes place precisely when one starts to take into account one's affecting and being affected. Learning, in other words, is not to be equivocated within singular individuals who are able to think, but rather within *situated* individuals whose relational entanglements (or belongings) within a particular milieu *make them think* [16].

4. Discussion: Learning to Navigate (in) the Anthropocene

This article offered an analysis of how Anthropocenic conversions reconfigure traditional modern and humanist underpinnings of space, time and collectives, and how these reconfigurations necessitate a reconceptualization of how we conceive of HESD. Presented in a minor key, the analysis we provided did not seek to denounce more established instrumental and/or emancipatory approaches, but rather presented a third, navigational approach that conceives of lecturers and students as actors who are

attentive to, and sensible for, situated acting and being in the Anthropocene. Offering an innovative theoretical grounding of HESD that aims to transcend bifurcations between the natural and the social, this navigational approach aims to present some relational sensibilities so as to become attuned to find one's way within the Anthropocene. Learning to navigate (in) the Anthropocene, then, points to the triple capacity of becoming sensitive to the heterogeneity of human and non-human entanglements, of becoming able to slow down one's habits of orientation and of engaging oneself to formulate propositions about what these situated practices need in order to thrive and prosper [16,30].

In conclusion, we propose some implications of this navigational approach for the role and position of lecturers in HESD. First of all, in presenting a relational way of being in the world that seeks to move beyond a human exemptionalism paradigm, the figure of the lecturer should not be exclusively understood in a traditional way here, i.e., as a person helping (often younger) students acquire knowledge, skills and/or attitudes. Rather, in this third approach teachers or lecturers should be conceived as *these actors that make other actors present in an educational milieu think*. This implies that lecturers (or students) are not lecturers (or students) by means of their predefined position, assigned roles and/or perceived functions, but only come into being through the conduct of the course. More precisely, someone or something is being enacted as a teacher at the moment that this someone or something forces other actors to slow down and become attentive for what a specific practice requires. Dunes or fish might thus, *at a particular moment*, come into being as teaching actors who force students to slow down and who insist that one needs to think in the presence of a particular situation. In a navigational approach, lecturers (and students) are not pregiven but *become*, and they come precisely into being when they insist upon the importance of, and create the conditions for the attentive studying of, a particular situation. As such, we could perhaps talk about *pedagogical teams of human and nonhuman actors* in order to stress this distributed lectureship which is constantly in the making. It goes without saying that the proposed navigational approach has profound implications for the professional development of academic staff, who are crucial agents for change in learning present-day students to navigate (in) the Anthropocene [70].

A second implication is that within this navigational approach, what is taking place within HESD courses cannot and should not be entirely predefined. The contents of such courses never only refers to predefined subject matters, but equally to questions pertaining to the collective that is being assembled in (and through) the course. Thus, in this approach teaching is not so much about envisaging a concrete endpoint (as it is in the instrumental approach), but neither is it about fostering individual emancipation (as it is in the emancipatory approach). Instead, teaching is about the creation of possibilities and opportunities for students to see and perceive the relationality of concrete, critical zones. In such critical zones, what is at stake is that (human and nonhuman) teachers should aim to establish conditions and relations of *intensive care* for the actors and relations between actors present in this zone [50]. Such a relationship of intensive care can only be established when one has the proper devices at hand; devices that slow down our reasoning and create opportunities for establishing a slightly different awareness of problems and situations that are mobilizing us today. In other words, intensive care can only be established once students become capable of enhancing their sensitivity for what is present within the learning milieu. Additionally, lecturers should aim to enhance an understanding in students that whatever one does within this milieu is never neutral, but always has consequences—and that one is, in that sense, always *responsible* for the collective of actors one studies [22]. At this point, it is important to not again associate this responsibility with some form of stewardship: lecturers should strive to create those conditions that let students experience the strength of belonging to a collective, in the particular sense of the word as described above. Such heterogeneous collectives should enable both students and lecturers to mutually experience the situated capacity of cooperating and caring in a relational manner [16].

Thirdly and finally, some words about the university as the home base of HESD and its lecturers. In a navigational vein, universities should not be considered as enlightened institutions that allow the present and the future generation to act upon the world. A situated being of universities in the

Anthropocene implies that universities and their inhabiting lecturers should not aim to independently and isolatedly create a better world. Rather, and in a minor key, they should aim to seek for experimental ways so as to become ever more entangled with collectives present within distinct critical zones, for it is such relational entanglements that enable collectives of students and lecturers to respond to what specific practices require. Importantly then, this paper largely dealt with how the lion's share of contemporary HESD research is still inclined to depart from fairly classical modernist and humanist assumptions. However, as we argued throughout this article, the vignette with which this paper took at the start clearly shows that in many contemporary HESD practices, principles and points of departure of a navigational approach are already put into practice. This article, then, is first and foremost an attempt to conceptualize and further develop a research field that is attuned to the Anthropocene, and to conceptually elucidate what many HESD educators are already doing on a daily basis (e.g., in the form of interdisciplinary project learning, lectures, service learning, and so many other initiatives). We refer here to these moments when lecturers are trying to address 'the more important'; when they are trying to listen to and give an account of what insists in situated, critical zones; and when they are seeking to enact the spatiotemporal constellations that allow students to learn to navigate our contemporary *and* future more-than-human world.

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