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# Ecocritical analysis of “glocal” essays on Lived Experiences of Climate Change in higher education

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As a “super-wicked problem,” climate change deserves a multidisciplinary approach in higher education that actively engages students with this global issue that has both local and regional consequences. The online short learning program “Climate change: from global to local action” combines environmental scientific, economic, and social knowledge. The conceptual model of Lived Experience of Climate Change (LivExpCC) aims at engaging students with climate change and explicitly adds the human dimension. Students write an essay using the LivExpCC-model: they connect their personal and local experiences with regional proximate influences and with broader global contextual influences of climate change. This stimulates the knowledge–reflection–engagement–action cycle. We analyze student essays from an environmental humanities perspective, looking specifically at distances (spatial and temporal distances and distances in interest). The results of these ecocritical analyses show that limited local distances and vivid inherited histories reflect the awareness of students of the effects of climate change and how they engage with it in different ways.

## KEYWORDS

climate change education, sustainability, higher education, lived experience, knowledge, multidisciplinary approach, science education, environmental humanities

## Introduction

Climate change is an all-encompassing problem and a complex threat to the ecosystem of our planet ([Intergovernmental Panel on Climate Change \(IPCC\), 2021](#)). Environmental scientific research aims at understanding its consequences on both a global and a local scale. In general, within this type of research, the issue of climate change is approached from an “objective” point of view, including that the world that is studied is placed outside the subjective self ([De Jong et al., 2013](#)). However, the way individuals, as well as social groups, understand climate change and its consequences is highly dependent on the stories connected to it: experiential narratives (“lived experience”) as well as imagined, fictional narratives (visual arts, performances, literature, film, television

series, etc.). Equivalent to scientific data, these cultural narratives may be seen as sources of knowledge that help us to understand and engage with climate change (Hulme, 2009; Perez Salgado et al., 2020). The Lived Experience of Climate Change (LivExpCC) is a people-centered concept introduced by Wilson et al. (2011), Abbott and Wilson (2014, 2015) that connects abstract and global scientific knowledge on climate change with individual and local experiences of humans. This concept re-examines the relationship between humans and the nonhuman world, and it expands the types of knowledge beyond “objective” knowledge from the natural sciences.

Within the discipline of the humanities, scholars investigate how people, through their cultural products, such as art and literature, engage with each other and with their natural environment. With this, underlying values are brought to the surface so they can be questioned and reflected on. Doing this, enables us to actively engage with the diverse aspects of the super-wicked problem of climate change, creating a space for multiple viewpoints on the problem and the supposed solutions. By creating this space, a more diverse population of citizens will be represented in the debate and can contribute to change that is necessary to cope with climate change. Questions considering the relationship between the human and the nonhuman world (nature, animals, and the ecosystem) are specifically relevant in the sub-disciplines of narrative theory, posthumanism, and ecocriticism. Ecocriticism specifically studies the representation of nature and the relationship between the human and the natural world in texts [these can be fictional texts as well as nonfictional texts or hybrid texts (Clark, 2011)] or other cultural expressions such as works of arts (Boettger, 2016), documentary, or film (Furuseth et al., 2020). In contrast to other diverse contemporary literary and cultural critiques, such as poststructuralism, ecocriticism does accept that to a certain degree we know the world as it is. Therefore, ecocritics acknowledge science as a source of truth concerning the natural world which is after all a prerequisite for assuming the influence of the role of human behavior on climate change (Bertens, 2014, 229–230). Although there is not one single method for such an ecocritical analysis, certain themes emerge regularly in ecocritical studies: the way the nonhuman world is represented and in what way the human world is situated in relation to the nonhuman world; whether the interests of humans are depicted as the only legitimate interests; how the human accountability toward the nonhuman world is depicted; and whether nature is a given fact or a process (Bertens, 2014, 226–227). By integrating such questions that derive from the field of the humanities into the discourse of discussing the challenges of climate change and sustainability, a broader view of the challenges is made possible.

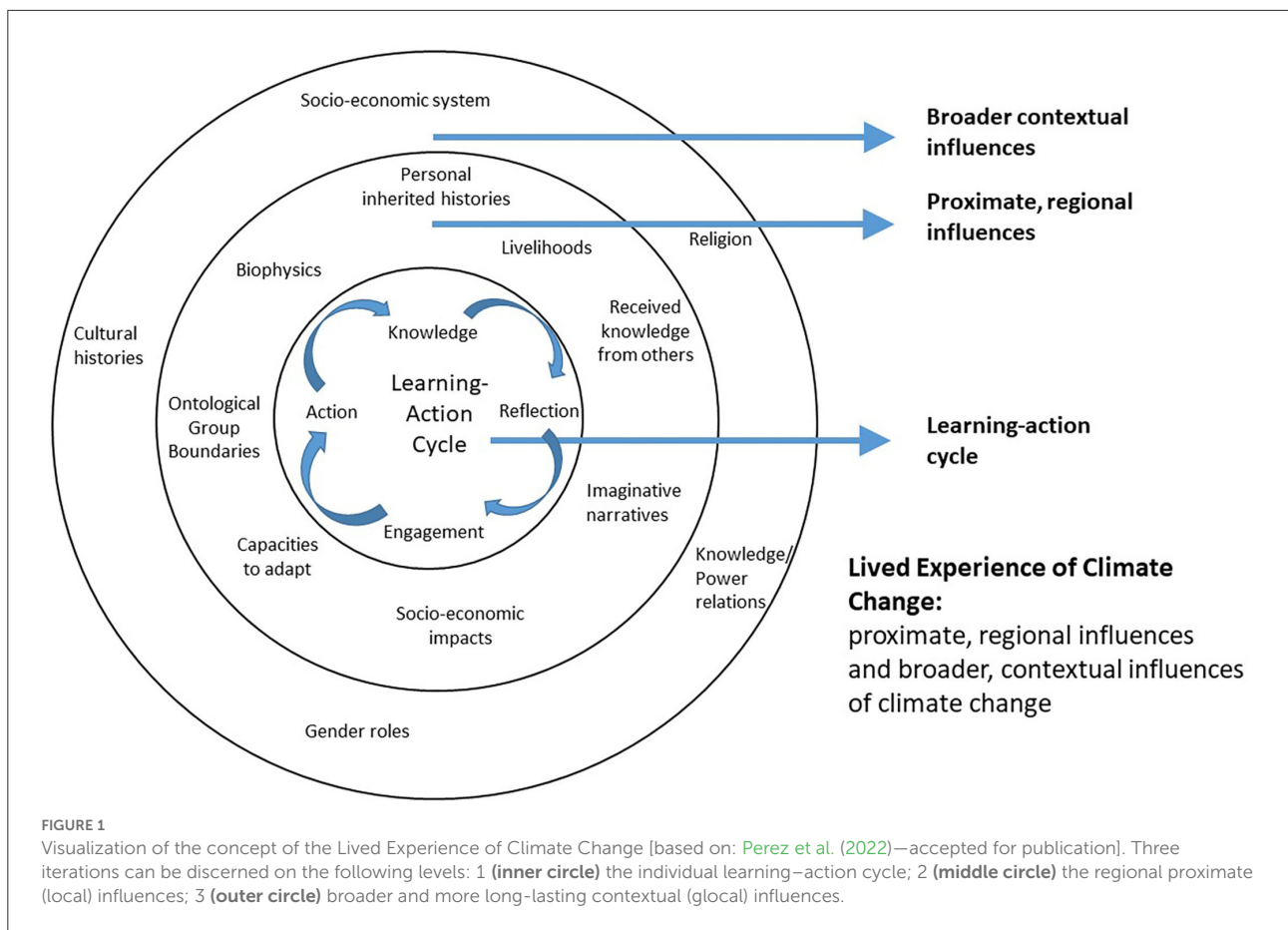
Education is one of the most powerful tools that may help humanity to limit and withstand the effects of climate change (UNESCO, 2017). To be responsive to the challenges of the “super-wicked problem” (Levin K, 2012) of climate change, we need to prepare students to contribute to a

society in transition. The ecological crisis is also a crisis of—mainly Western—thinking, as it is dominantly organized by the objective/subjective dichotomy. Therefore, it is a crisis in our educational system for this is the very practice that shapes that thinking (De Jong, 2019). There is an urgency for learning as constructing (new) knowledge to modify and expand our thinking competence in dealing with new situations in our modern society (Perez Salgado et al., 2014). This not only calls for more “holistic” knowledge construction but also calls for new didactics to stimulate other ways of thinking and acting (Sipos et al., 2008; Brundiers et al., 2010; Caniglia et al., 2016). Creating climate change education that fits a resilient future society asks for a truly new educational design, creating new, multidisciplinary, and interdisciplinary knowledge and new ways of thinking (Horn et al., 2022).

## Theoretical background

The people-centered concept of the “Lived Experience of Climate Change (LivExpCC)” was introduced by Wilson et al. (2011) to address the human dimension in CCE: individual and local human experiences considering climate change are accepted as valid sources of knowledge. The conceptual model is people-oriented and explains scientifically that there are simultaneously multiple perspectives on a sustainability process. The concept is visualized by a learning–action cycle with the elements of knowledge–reflection–engagement–action (Figure 1, middle), based on the experiential learning theory of Kolb (1984). The knowledge includes “exact” scientific facts and “experiential” situated knowledge (Haraway, 1988, 2015, 2016), accumulated during one’s lifetime in a certain place at a certain time (and with a specific [socio-economic, gendered] history). The different types of knowledge are integrated into a person and lead to reflection on that knowledge. This may lead to action through engagement in the immediate environment and in the event of an acute threat. This process also takes place on a collective level when individuals group and unite. Individual experiences can be translated to collective experiences when citizens exchange their ideas and organize with respect to the threats or dangers that matter. This model also maps regional influences and factors that are relevant to the specific situation, as proximate (Figure 1, middle circle) or broader contextual influences and factors as glocal (Figure 1, outer circle). Finally, the model also pays attention to the effects of power on knowledge development (Foucault, 1980). This holistic and integrated approach provides insight into the most important aspects for individuals (and groups) that play in their nearby specific climate change issue. Also, it might contribute to their knowledge and actions in their immediate living environment.

The Lived Experience of Climate Change concept connects individual and local experiences *via* regional influences and



broader contextual influences and power relations to the global climate change crisis. This creates a learning environment that we can refer to as “glocal.” In doing so, we align with the meaning this term has in higher education for sustainable development, as defined by Caniglia et al. (2018). Glocal refers to a learning environment that enables students to relate global and local knowledge, experiences, and engagement in relation to ontology, epistemology, and ethics. Glocal ontology acknowledges the interconnectedness of diverse local and global realities, deriving from, for instance, political and cultural processes. Glocal epistemology acknowledges that sustainability issues ask for the connection of local and global considerations. Glocal ethics acknowledges normative and ethical implications of knowledge as knowledge indicates social actions in both global and local contexts and questions the existing systems of values and power (Caniglia et al., 2018, 369). These three components are found in the LivExpCC model that at the same time visualizes their underlying structure. In the current study, our aim was to investigate how students in higher education engage with their local lived experiences and their global context, using an ecocritical lens on essays that were written as part of the Master’s course The LivExpCC (~80 study hours). We examine what insights an ecocritical analysis

that derives from the humanities can provide in understanding how students internalize a holistic approach offered in climate change education. This analysis can contribute to defining starting points in the program for future extension of the multidisciplinary character of courses where the discipline of the humanities can play a meaningful role. This would meet the call to develop Climate Change Education (CCE) in an inter-/multidisciplinary manner (Horn et al., 2022) and also specifically to involve the humanities in this (Allison and Miller, 2019). The added value of humanities in approaching climate change is also explained and illustrated in the special issue “Environmental Humanities Approaches to Climate Change” (introduced by Higgins et al., 2020). By offering critique and “analyzing, nuancing, and challenging totalizing narratives” (Higgins et al., 2020, 1), the humanities can, for instance, stimulate underprivileged groups to respond to climate change, help to frame climate change-related issues and narratives in a socially just way, and encourage students to think critically about these issues (Higgins et al., 2020, 2–3). A critical mindset is one of the characteristics that students should develop to address sustainability issues, and that is also one of the specific aims of a glocal curriculum (John et al., 2017, 19).

## Methodology

We analyze student essays from the Master's online course LivExpCC (~80 study hours). This course is part of a so-called Short Learning Program "Climate change: from global to local action" (~300 h) and was developed in cooperation with three universities, namely, Universidade Aberta (Portugal), UNED (Universidad Nacional de Educación a Distancia, Spain), and the Open Universiteit (the Netherlands). A glocal curriculum that enables students to connect global and local interconnectedness and interdependency ideally bring together students from different countries (John et al., 2017, 20), as was the case in this course that was followed by students from the Netherlands, Portugal, and Spain. Moreover, the course meets the three principles of a glocal curriculum described by Caniglia et al. (2018, 369); it includes knowledge from local to global contexts and scales, the course has a transnational setting based on collaboration, and in the course, digital technologies are combined with experiences and engagement in local contexts. The course takes a competence-based approach and aims at connecting knowledge with transformative action, as described by Dlouhá et al. (2019), and in the competency framework for sustainability (Wiek et al., 2011; Brundiers et al., 2020). The course ran from February until June 2020 and coincided with the start of the COVID pandemic. The aim of the course is to introduce the concept of the LivExpCC and its potential contribution to policy and actions for adaptation and mitigation. The course aims to inform and analyze information about climate change from different perspectives, whereby scientific, political, economic, and social knowledge is integrated, applying the conceptual model of LivExpCC. The course also aims to discuss the different adaptation and mitigation measures of climate change that humans can implement to improve and cope with their environmental surroundings. Students write an essay (that is graded) in which they choose a subject close to them and demonstrate knowledge and understanding of the concept of the LivExpCC, and the contextual aspects of people's lives, on an individual and collective level. They also critically learn to analyze whose lived experience counts: from practical knowledge to knowledge as a power. The essays (~3,500 words) are graded according to several criteria that the students get at the start of the course. These include describing a specific example or case of the Lived Experiences of Climate Change in the vicinity or elsewhere (city, region, country). The essay should show elaborations of individual lived experiences, collective lived experiences, effects of power/knowledge relations (regimes of truth), and a final conclusion where a connection is made between previous results with policy (making) on climate change, and the student's reflections on this connection.

Three essays were selected for an *ecocritical analysis*, where students chose a regional subject and provided an extensive

analysis of the LivExpCC model. For reasons of spreading, we chose one essay from each participating country; the essays were chosen at random (no further selection criteria). Because we provide an in-depth analysis of each essay, we had to constrain ourselves to three essays. Performing an ecocritical analysis of cultural products means that the representation of the natural world in these products is studied. By connecting these representations to meaningful frameworks (such as moral and esthetic), the attributed function of nature appears explicitly. Because of the emerging awareness of human influence on nature and climate, as well as the shifting viewpoints on the Western, dominating relation with nature, ecocritics concentrate on the position of the nonhuman and critique the traditional human-centered viewpoint. This results among others in interest in questions relating to scales. Originally, ecocritics focused on literary texts, but the field of vision has expanded and included nonfictional texts as well as works of art, film, and documentary. The essays that students wrote for this academic course form an interesting new medium to submit to an ecocritical analysis. A notable starting point is, however, that the essays we analyze here are *inherently* human-centered for they were part of a course on the Lived Experiences of Climate Change. Students were asked to engage with their own experiences, after having gained scientific, political, economic, and social knowledge in two previous modules. The concept of the learning–action cycle is also human-centered and shows the relation between knowledge and action. The ecocritical analysis still enables us to extract the relationship between the students and their (natural) environment. Moreover, due to the LivExpCC model, students will relate local and regional data to a more global scale as well as looking at diverse points in time (looking backward as well as looking forward). We base our ecocritical analysis largely on the work of Ameal (2017), who specifically looks at *distances* between humans and the natural nonhuman world. In the current analyses, we look at three types of distances, namely, distances in location, time, and interests.

## Materials

The first essay is written by Raquel from Spain. She describes the Ebro Delta, which has suffered a deep transformation during the last decades and is extremely vulnerable to the effects of global warming. The second essay is written by Paulo from Porto in Portugal. Here, the sandy coastline is decreasing due to climate change (rising sea level and the increase in extreme weather). This has consequences for nature and human use of the coastline. The third essay is written by Sanne from the Netherlands, and she chose climate depression in the Netherlands as her subject. She does not suffer from this herself but knows diverse persons in her surrounding that do suffer from it.

## Extreme storms on the Iberian Peninsula vs. indirect impacts of cc in the Netherlands

### Essay 1: Raquel (Ebro Delta)

Raquel describes her lived experiences of a place she visits regularly since childhood: the Ebro Delta on the east coast of Spain. Her knowledge is expanded through the transmittance of lived experience to her by her uncle Manolo for some 60 years. So, one generation of experiences is added to her own lived experience; this personal inherited history is a proximate influence of her LivExpCC. This LivExpCC is further extended to the past by referring to a broader contextual influence of cultural history, namely, the history of agriculture in the Ebro Delta, which she explicitly frames as a “human cohabitation with the natural ecosystem.” By this, she more or less seems to refer to a stable balance between culture, agriculture, and nature throughout a longer period. This balance is now being disturbed. This can be concluded from the individual observations from Raquel and her uncle, considering, for instance, the sea moving land inwards, but also from the proximate and broad collective influences. Most obvious for Raquel was the storm “Gloria” (January 2020) that hit the Ebro Delta only a few months before she wrote her LivExpCC essay and which she connects to the knowledge that was already available as a lived experience of her uncle:

*“So, Manolo has the historic memory of the progressive transformation due to human action and we both have the proof of what an extreme natural event additionally has. [...] Human activity has led to this situation due to construction of water infrastructures that have changed the dynamics of the area.”*

With help from the LivExpCC model, Raquel connects types of knowledge from local (including knowledge on the economic infrastructure of the area and scientific knowledge on the complex ecosystem of the delta and its biodiversity, the balance between fresh water and saline water, and the degenerative dynamics of the deltaic plain) to global scales (the predictions considering the rising of the sea level due to melting polar ice and the rising temperature of seawater). Meaningful is the consensus that already seemed to exist between the inhabitants of the Ebro Delta considering the problems they face in their living environment, which have increased as more entities became interested in the protection of the natural spaces in the delta. Inhabitants together opposed the building of dams, initiated by the central and regional governments. The knowledge of the area of the inhabitants made it clear dams would break the balance in the delta. However, the government was not interested in this knowledge, nor did it intend to gain any other knowledge on the area and the effects the dams would initiate. Storm Gloria served as an eye-opener to the governments. This one-time disaster of

extreme weather served as a warning and a vision of the future. Instead of trusting the LivExpCC of local inhabitants, a taste of the future was necessary to persuade a distant government of the upcoming threat of climate change. The value of this storm as a source of knowledge for a distant power agency brought Raquel insight into the importance of connection and belonging in the learning–action cycle: not only can different pieces of knowledge be connected to each other, so that a broader vision is possible, but also the urgency of action is enhanced.

### Essay 2: Paulo (Porto)

In Paulo’s story of the Portuguese coastline, and more specifically the coastline near Porto, many sources of knowledge come together, indisputably creating urgency considering the threats of global warming. These sources of knowledge include data on temperature and weather conditions, future scenarios, but also personal experiences and personal inherited histories.

Paulo characterizes specifically coastal areas as zones that “assume an increasing strategic importance in environmental, economic, social, and cultural terms,” which implies diverse types of knowledge. These are indeed available, and Paulo focuses on scientific data on temperature rise and the increase in extreme weather conditions. Moreover, two future scenarios have been calculated that indicate how the coastal line will look in 2,100. However, although the diverse types of knowledge he observes create an evident image of the threats of global warming to this local environment, any coherence seems to be lacking in policymaking. This lack of coherence speaks directly from Paulo’s description of the learning–action cycle (first iteration) of the LivExpCC model when he tells how he has visited Madalena beach. Paulo, who is originally from Porto, not only draws from his own experiences since childhood but also explicitly states his experiences are “enriched” by those of his parents (born in the 1930s), a personal inherited history that serves as a proximate influence on Paulo’s learning–action cycle. The knowledge he gains from his lived experience, therefore, goes back one generation. Over this time, he has collected observations of himself, his parents, and friends considering changes in the coastal area: changes in the amount of sand on the coast, changes in extreme weather, and changes in the occurrence of sea life. Striking is the way he now visits the Madalena beach and his perception of the area, compared with how he and his father visited this beach in his childhood and how the area looked like then:

*“I want to share the lived experience of the drastic alteration of dozens of kilometers of seafront, that I’ve frequented for over fifty years, in the summer and frequently during the winter, practicing winter sports. My father took us camping near one of the beaches I still go today, Madalena Beach, due to the legislations and real estate market, it’s only possible to camp in one authorized camping ground.”*

*The entire coastal area evolved so to satisfy mainly tourist demand. Most beaches along this coastal area had at almost twice the sand we have today, the sea was not as “brutal”, being a rocky coast, sea life was abundant and was easy to find, different types of molluscs (mainly mussels), also octopus, today most of this life has disappeared. Friends of mine, amateur fishermen, have told me that it seems to be more difficult to catch fish on the coast line and even along on the Douro River bank (Douro River), than a few years ago.”*

Local inhabitants cannot freely go to their coastline due to the privatization of the area. Paulo describes the collective proximate influences and the broad influences. This enables him to connect what is happening at the coastline near Porto to what is happening on a global scale due to climate change. This results in an image of the availability of an extensive and broad amount of knowledge (on temperature, erosion, and rainfall, all calculated through scenarios). However, the missing connection to actual policymaking is repeated on an ever-increasing scale from local to global. The concrete outcome of this lacking policy manifests itself in the further construction works on the coastal area. Besides all the data and scenarios, an actual storm in the winter of 2014 acted as a warning and made clear what will happen in the future. Even despite this very tangible visionary, no action has been taken or a change in policy has been made. So, political and economic pressure and prioritizing short-term investments did not only detach Paulo from his Madalena beach, but it does not acknowledge the collective types of knowledge of the local residents for the action that would be needed.

### Essay 3: Sanne (The Netherlands)

Sanne has climate depression in the Netherlands as the subject of her LivExpCC essay. Climate change-related depression has set foot in the Netherlands, although no exact numbers of sufferers from this form of depression are available yet. Although Sanne does not suffer from climate depression herself, the fact that many of her friends do enables her to choose this as a suitable subject for an account of LivExpCC. Sanne stresses the strong relation between the impacts of climate change, a person's lived experience, and the impact of depression on engagement and action: essential parts of the learning–action cycle. For several people, climate depression is a trigger to engage in climate activism; for others, climate depression like other forms of severe depression is precisely what prevents them from taking any action. The choice made in this essay to discuss the situation *in the Netherlands* was prompted by the author's place of residence. There are her friends and acquaintances located that inform her of proximate influences: personal inherited histories of dealing with climate change-related depression, mainly of people involved in climate activism (such as Extinction Rebellion). Furthermore, Sanne

links sensitivity among Dutch people for climate depression to the Dutch past, the Netherlands being an aggressive colonizer and slave trader. According to Sanne, the Dutch are said to feel consciously guilty about the impact of their own actions on climate change, which mainly causes damage elsewhere around the globe. Other types of knowledge Sanne includes are related to psychological knowledge on depression and policy. She describes how climate activists suffering from climate depression value scientific knowledge on CC:

*“I am in close contact with someone with CC related depression who joined XR [= Extinction Rebellion] last year and saw him change his view and thoughts on what impacts CC has and will have on the world. He used to always base his view on scientific knowledge, but now seems to rely even more on information from within XR than anything else. If scientific publications show less destructive predictions than thought of within XR, he is very skeptic on the quality and background of the research, where he would not have been before joining XR. Which (...) could make one argue that joining an action group could even worsen CC related depression.”*

However, this scientific knowledge itself is not directly relevant to her essay, which aims at relating climate depression to policymaking. This Dutch manifestation of depression has an important characteristic: in the Netherlands up to 2021, climate depression was mainly caused by a confrontation with the *indirect* consequences of climate change. Although direct consequences of climate change are indeed noticeable in the Netherlands, such as raising average temperatures, the direct threats are more pressing in the Global South, which Sanne acknowledges in her essay. She explicitly notes that she did not find any accounts of climate depression in the Netherlands caused by direct impacts. In the meantime, the unusual and severe flooding in the southern part of the Netherlands in the summer of 2021 (the essay was written in the spring of 2020) has changed this for the residents living in that part of the country.

Although one might think that depression negatively influences willingness to act and therefore the “action” in the learning–action cycle, Sanne seems to describe an opposite effect that only seems to apply to a part of the people suffering from this type of depression. For them, climate depression actually leads to actively engaging in climate activist groups. According to Sanne's experiences, the negative effects of climate depression are to be found in other parts of the learning–action cycle, namely, the knowledge and reflection, and concern the extent to which people value the outcomes of new scientific research. In general, knowledge derived from the natural sciences on climate change is valued high among climate activists. For those who suffer from climate depression, however, it seems that only the most negative scientific scenarios that correspond to the convictions that foster the feelings of climate depression are considered *true*. Scientific knowledge and other types

of knowledge provided by proximate or broad contextual influences that are inconsistent with these most negative scenarios are depreciated. This triggers Sanne to consider the feelings and experiences of sufferers of climate depression a useful source of knowledge for policymakers because it can bring related problems on health to the surface. Prioritizing and communicating policy may be done differently, so it will lead to ways to better create support and engagement among citizens.

## Results

Having summarized the essays, we show the results from the ecocritical viewpoint, specifically addressing the *distances* between the human and the natural or nonhuman world, considering location, time, and interests. With the concept of spatial distances, we look at locations of the personal, inherently human-centered experiences and the connection to locations of the natural world that are made. With temporal distances, we investigate the span of the narratives that are described in history and the future, and how this time span is connected to present-day experiences. Our third focus point is interests: what weight is given to diverse stakes and in what way are the human interests related to the concerns of the nonhuman world?

### Spatial distances in the human and nonhuman world

All three essays acknowledge the global character of climate change, both causes and effects, and the huge local differences that these have. The first two essays, both originating from the Iberian Peninsula, describe places located on practically the same latitudes: the first is situated on the western coastline facing the Northern Atlantic Ocean and the second is situated on the eastern coastline of the peninsula that borders the Mediterranean Sea. These essays remain close to their own living environment, and they connect it to the global consequences of climate change including sea-level rise. Both students describe places they feel connected to; the spatial distance is close. These sentiments of attachment are reinforced in both narratives by emphasizing the connection is already existing for more generations in the family, and that is still valid for several family members: there is a collective connection that spans more than one lifetime, but not more than two generations. Older family members pass knowledge of the areas and experiences with it on to the students who expand their own knowledge and views. However, the rapid changing of the local environment seems to make inhabitants feel detached from their living environment. A prime example of this is the limits to visiting one's own coastal area as described by Paulo, which seem to be in line with the low appreciation by governments for local lived experiences as sources of knowledge. This detachment of humans and

their living environment seems to be illustrative of the missing coherence between the diverse sources of knowledge and the willingness to implement appropriate local- and regional-based policy.

Although climate change is evidently acknowledged as a global problem, the focus is on the direct consequences for the students' own living environments and the consequences for different layers of the population of the areas. The vulnerability of coastal strips worldwide is acknowledged, but the focus stays on the local situation. Contemplating the effects of global warming, both Iberian essays recognize the nonhuman world explicitly by looking at local wildlife and sea life, vegetation, and the natural environment, although these environments were created by humans. The balance between the human and the natural world is always the starting point of thinking about these environments: this balance is measured using human-centered values.

The third essay describes climate depression in the Netherlands, although it states that climate depression can also occur elsewhere. Sanne chooses the Netherlands because she lives there and the sufferers she knows personally also reside there. They are part of her immediate environment and are therefore proximate influences. Climate activists are mentioned as a specific group where climate depression can occur, caused by indirect effects of climate change (although this may have changed since the flooding in the summer of 2021, i.e., after Sanne wrote her essay). With this, the author makes a significant choice. The Dutch essay links depressive feelings about climate change mainly to the situation outside the Netherlands because of the direct impact of global warming yet is limited in the Netherlands. Sanne adds a reflection on the feelings of guilt that she links to the colonial past of the Netherlands. However, it is likely that this observation is mainly shared in left-wing activist circles of which Extinction Rebellion is part of and this reflection is not widely spread in the Dutch population. Although Portugal and Spain also have colonial pasts and involvement in slavery, a similar reflection on guilt and the colonial past is not part of the Portuguese and Spanish essays. This subject does not seem to be directly relevant to these cases that focus on the *direct* local and regional impacts of climate change. Where the Dutch student already links the current situation in the Netherlands with their colonial past, she does this in a very limited way by trying to explain the feelings of guilt felt by the Dutch. However, the transfer to a sustainable society raises many moral questions related to inclusion and white privilege, power, and post-coloniality. In the [Intergovernmental Panel on Climate Change \(IPCC\)'s \(2022\) latest \*Mitigation of Climate Change\* report](#), "colonialism" is finally included as a driver of the climate crisis but also as an ongoing problem that increases the vulnerability of communities to it. A more extensive relationship between the local lived experience and the power relations in the past and present in these essays could not only expand the case itself

but also lead to more realistic and inclusive handling when considering possible solutions for both the human and the nonhuman world.

## Temporal distances in the human and nonhuman world

Both Iberian students include the past in their essays: Raquel mentions that rice has been grown in the Ebro Delta for two centuries. Paulo looks back at his childhood and covers therefore about 50 years in which he (and his father) in their leisure time frequented the natural environment close to their home. Both students describe the changes in the area since one generation above them: these developments are outlined by observations of themselves and family and friends (such as the coastline retreating and less fish caught). These observations are linked to scientific data such as measurements of salinity in the Delta. The Dutch student mentions the colonial past of the Netherlands, which she relates to part of the Dutch being sensitive to feelings of guilt, but she does not explicitly include a more personal past to the case she describes, presumably because climate depression and the related terms eco-anxiety and solastalgia are relatively new concepts.

Similar to the past, visions of the future play a prominent role in the essays. Partly, scientific future scenarios were used to complete the LivExpCC. Next to this, visions of the future were included in relevant policies. Both Iberian essays speak explicitly about the particularly vulnerable status of both areas to the effects of climate change: the impact not only is great now but also threatens to be much greater in the future. Next to the gradual changes that have been visible to the students and their families in previous years, both essays explicitly mention a recent storm as a turning point: the storm “Gloria” in January 2020 near the Ebro Delta and the winter storm that wreaked havoc near the coast of Portugal in 2014. The specific storms with their extreme waves feature as visible turning points: both storms destroyed things that can never be restored. Raquel states: ‘[...] *the strong waves provoked by “Gloria” awashed farmland that will no longer recover*’; Paulo writes: ‘*The sea came with extreme violence, destroying almost all these facilities along the several kilometers of beaches, in some cases it was not possible to rebuild [...]*.’ In the case of the storm “Gloria,” Raquel observes that it has an impact on the awareness of the diverse local parties, and this affected local policymaking. Paulo did not see effects in policymaking after the 2014 storm he described in his essay.

Although the Netherlands can be seen as a vulnerable area in view of its partial location below sea level, the Dutch essay does not discuss the direct impact on the living environment in the Netherlands now or in the future. This may have to do with the dominant narrative of the Netherlands as the master

of the water: coping mechanisms are culturally determined. Also, at the time, no climate change-related floodings happened yet (this changed in July 2021, a year after Sanne wrote her essay). Although Sanne does not include a historical view on the Dutch dealing with water, currently Dutch scientists and water management policymakers are interested in these historical data on the Dutch landscape and the dealing with water.

The views of the future that Paulo describes and uses for his LivExpCC analysis are mostly based on scientific predictions up to the year 2100 of temperature rise and sea-level rise. Raquel and Sanne focus on more short-term use of the experiences for policymaking that should have an impact on short notice. Including specifically a more extensive *historical* viewpoint that explicitly includes attention to the natural world may provoke thinking about alternative ways of living and dealing with the natural world, which also may affect the views on future goals worthy of pursuing.

## Distances in the interests of the human and nonhuman world

The interests of the human and nonhuman world may be intertwined considering accelerated global warming (e.g., loss of biodiversity will affect food production for people). In that sense, this interrelatedness can be put forward in these essays that start from a human-centered perspective. There is a clear division between the representation of nonhuman interests in both the Iberian essays and the Dutch essay, which may be related to the experiencing of direct impacts of climate change or indirect impacts of climate change. These differences emerge when describing solutions: exactly which problem has to be solved?

Both Iberian essays describe areas that have long been influenced by humans for economic reasons. The fact that people live together with nature is mainly colored by an anthropocentric perspective (agriculture and tourism). The landscapes and their uses are linked to climate change and sea-level rise and loss of economic yields now and in the future. The area of the Ebro Delta has been inhabited and cultivated by humans for centuries, the cultivation of rice that set in motion the current economic development of the area started about two centuries ago. For the Porto coastline, tourism seems to be of great economic impact and has been important for decades. However, the expansion of tourism in this area has not only economic consequences but also made certain areas inaccessible to local inhabitants. By losing the possibilities of personal experiences of wild camping, local inhabitants have fewer opportunities to connect with and be a part of their natural environment.

The Iberian essays look for solutions that call for governments and residents and their different interests to be more aligned. The Dutch essay also sees a role for the



government in a problem, although it is a psychological problem. The surplus value of including policymaking is only formulated by Sanne as useful for humans as it is good for their psychological health. The fact that depression can have a paralyzing effect and therefore negatively affect the willingness to act remains implicit in the proposed solutions. Climate depression is, of course, an anthropocentric concept, but it can have effects on the willingness to take action and thus have negative consequences for the mitigation of climate change.

## Discussion

Integrating the humanities in Climate Change Education (CCE) seems a promising route using the LivExpCC model. The humanities may increase the level of attending critique, nuance, and multiple perspectives to the current model, which is important for education on sustainability issues (John et al., 2017, 19). It may also increase students' awareness of diversity and enable them to acknowledge this as well. This then will lead to a better ground for transnational collaboration and possibilities of knowledge production with fellow students in a global curriculum. Specifically, ecocriticism shows to be a promising paradigm for the expansion of the LivExpCC model. Adding the subsequent discipline of ecocriticism, embedded in the humanities, as a source of knowledge in the learning-action cycle, students may be more actively challenged to question and nuance their LivExpCC analysis of the complex matter of climate change. Explicitly questioning the human-centered starting point of the model in CCE may make room for a more broader view on the matter and therefor nuance the base values of the students in their LivExpCC. Questioning anthropocentrism, which is now lacking, could enrich the essays and with this add to the paradigms that lead to thinking about actions and solutions that eventually lead to policy recommendations. Also, intended goals may be critiqued and choices for aiming at certain goals can be nuanced or adjusted.

This field of scholarship seems to be a fruitful addition, and with this approach, the evaluation of the students' essays may be enriched as well. Therefore, we plan not only to integrate the humanities to improve the didactics and assignment of the present course, but also to investigate how this implementation would help to evaluate the students' essays (Perez et al., 2022—accepted). Moreover, in future, we aim to add cultural products related to climate change as a specific feature of proximate influence (the middle circle in the model). Next to environmental artworks, fictional narratives in diverse forms (books, films) may be explicitly useful in expanding students' understanding of climate change and the diverse dimensions considering place, time, and interests in particular. Fictional narratives are claimed to engage readers in the problem of climate change (Nixon, 2011; Ghosh, 2016; Weik von Mossner,

2016; Schneider-Mayerson, 2018). By adding such narratives, experiential and imaginary process thinking tools, and as sources of "authoritative" knowledge, a more holistic understanding of climate change in higher education can be created. In both, narratives and imagination can play a fruitful role. In diverse levels of education, initiatives exist to insert climate education into humanities, arts, language (or literature) education (see, e.g., Climate Generation.org, in press; Siperstein et al., 2016; Siegner and Stapert, 2020; Djapo.be, in press). The value for adding fictional narratives as a source of knowledge in the CCE seems to be promising and aligns with including the humanities in CCE. The main study objects of the humanities are the infinitely diverse cultural products such as fictional narratives. These cultural products react and reflect on all sorts of (social) issues in many diverse ways and levels and also can influence the public domain in dealing with or thinking about these issues. Climate change is one all-encompassing and major issue that requires holistic viewpoints, and we need a multidisciplinary educational setting for our future professionals.

## Conclusion

We used an ecocritical lens to analyze higher education student essays on climate change experiences. We specifically looked at distances in location, time, and interests between humans and the nonhuman world. Surfacing the way these three types of distances play a role in the LivExpCC essays showed us how students relate to climate change as a complex problem with diverse consequences on global and local scales. The LivExpCC model proves to be a model that enables students to make connections between points in this complex issue between which there is a distance. By making these distances visible and attributing significance to them, it is possible to further develop the use of the LivExpCC model in CCE critically.

In the essays that were analyzed, diverse forms of knowledge are identified: situated knowledge and local knowledge about residents' living environments are integrated with scientific knowledge about the consequences of climate change. The difference in appreciation of scientific knowledge by different groups is discussed. All essays have a human point of view that influences, for instance, the value of the economy and the relation with timescales. Anthropocentrism is not rejected nor questioned, which is inherent to the current design of the assignment of the students.

Using the LivExpCC model in higher education on climate change proves to result in valuable analyses of local and regional situations relating to this global problem. The model enables students to directly relate to climate change despite the fact that the experience of effects of climate change is very diverse around the globe. Especially for students whose daily lives are not so much affected by global warming, it is eye-opening to more consciously relate to climate change. The LivExpCC model

ensures that students understand the connection between their local and regional environment and recognize the (future) effects of climate change. They will realize the relationship between scientific data and their own living environments and the value of their own experiences as a source of knowledge. Awareness and feeling connected with this global problem will probably positively influence their learning and their ability to add to sustainable developments in their own region.

What is striking is that the LivExpCC model encourages the students to make explicit connections between the local and the global. The local and personal experiences are decisive for them (they see the changes and thus the dangers with their own eyes). Other inhabitants of the areas have similar knowledge. This knowledge is not appreciated by the authorities (or in Raquel's case, not *initially* appreciated). The Iberian students present a storm as a moment of panic in the present that breaks with the current trend and therefore serves as a very tangible glimpse into the future: this is how it will be. In the case of Raquel, this has narrowed the gap between the local population and the persons in power: the persons in power also have this experience and value it. This may relate to limitations of our imagination, as stated by Indian climate fiction novelist Amitav Ghosh (2016): describing a real, self-experienced tornado comes across as implausible to the reader who has not experienced it. In the Iberian cases that were described, the effects of the storms, however, differ. In the Portuguese case, there remains a discrepancy between the diverse types of knowledge and the actual action and policy. This discrepancy may be caused by the fact that the policymakers do not sufficiently take into account this knowledge in their decision making. Education should be aimed at (re)valuing different forms of knowledge, to ensure future policymakers do not wear blinkers and are more open to valuing diverse forms of knowledge more equally and viewing problems at a holistic level.

## Data availability statement

Further inquiries about the original contributions presented in the study can be directed to the corresponding author.

## References

- Abbott, D., and Wilson, G. (2014). Climate Change: Lived experience, policy and public action. *Int. J. Clim. Change Strat. Manage.* 6, 5–18. doi: 10.1108/IJCCSM-04-2013-0040
- Abbott, D., and Wilson, G. (2015). *The Lived Experience of Climate Change: Knowledge, Science and Public Action*. Cham, Heidelberg, New York, Dordrecht, London: Springer.

## Ethics statement

Written informed consent was obtained from the individuals for the publication of any potentially identifiable images or data included in this article.

## Author contributions

MH was involved in methodology. PP was involved in conceptualization. MH and PP were involved in the investigation, formal analysis, and writing. Both authors have read and agreed to the published version of the manuscript.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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- Allison, S. D., and Miller, T. (2019). *Why Science Needs the Humanities to Solve Climate Change*. Available online at: <https://theconversation.com/why-science-needs-the-humanities-to-solve-climate-change-113832> (accessed June 27, 2022).

- Ameel, L. (2017). “The city novel: measuring referential, spatial, linguistic, and temporal distances,” in *The Routledge Handbook of Literature and Space* (London: Taylor and Francis), 233–241.

- Bertens, H. (2014). *Literary Theory, the Basics. Third edition*. Abingdon, New York: Routledge.
- Boettger, S. (2016). "Within and Beyond the Art World: Environmentalist Criticism of Visual Art", in *Handbook of Ecocriticism and Cultural Ecology*, eds H Zapf (Berlin, Boston: De Gruyter).
- Brundiers, K., Barth, M., Cebrián, G., Cohen, M., Diaz, L., Doucette-Remington, S., et al. (2020). Key competencies in sustainability in higher education—toward an agreed-upon reference framework. *Sustain. Sci.* 16, 13–29. doi: 10.1007/s11625-020-00838-2
- Brundiers, K., Wiek, A., and Redman, Ch.L. (2010). Real-World Learning Opportunities in Sustainability: From Classroom into the Real World. *Int. J. Sustain. High. Educ.* 11, 308–24. doi: 10.1108/14676371011077540
- Caniglia, G., John, B., Bellina, L., Lang, D., Wiek, A., Cohmer, J., et al. (2018). The glocal curriculum: A model for transnational collaboration in higher education for sustainable development. *J Clean Prod.* 171, 368–376. doi: 10.1016/j.jclepro.2017.09.207
- Caniglia, G., John, B., Kohler, M., Bellina, L., Wiek, A., Rojas, Ch., Laubichler, M.D., et al. (2016). An experience-based learning framework: activities for the initial development of sustainability competencies. *Int. J. Sustain. High. Educ.* 17, 827–852. doi: 10.1108/IJSHE-04-2015-0065
- Clark, T. (2011). "Genre and the question of fiction and non-fiction," in *The Cambridge Introduction to Literature and the Environment*. Cambridge: Cambridge University Press, 35–45, 235. doi: 10.1017/CBO9780511976261.006
- Climate Generation.org, (in press). *Empowering Individuals and Their Communities to Engage in Climate Change Solutions*. Available online at: [climategeneration.org](http://climategeneration.org) (accessed June 27, 2022.).
- De Jong, F. (2019). *Kennis in-(ter)-actie: responsief leren als kennis construeren [Knowledge in-(ter)-action: responsive learning as knowledge construction]*. Heerlen: Open Universiteit. doi: 10.46884/2020.4
- De Jong, F., De Beus, M., and Richardson, R., and Ruijters, M. (2013). Ecologically and transdisciplinarily inspired research: starting points for practitioner research and sustainable change. *J. Organ. Transform. Soc. Change* 10, 163–177. doi: 10.1179/1477963313Z.0000000008
- Djapo.be, (in press). *Educatie voor Duurzame Ontwikkeling*. Available online at: <http://djapo.be> (accessed June 27, 2022.).
- Dlouhá, J., Heras, R., Mulà, L., Perez Salgado, F., and Henderson, L. (2019). Competences to address SDGs in higher education—a reflection on the equilibrium between systemic and personal approaches to achieve transformative action. *Sustainability* 11, 3646. 1–23. doi: 10.3390/su11133664
- Foucault, M. (1980). *Power/knowledge: Selected Interviews and Other Writings, 1972–1977*. Ed: Gordon, C. New York: Vintage Books.
- Furuseth, S., Gjelsvik, A., Gürata, A., Henning, R., Leyda, J., Ritson, K., et al. (2020). Climate change in literature, television and film from Norway. *Ecozon* 11, 8–16. doi: 10.37536/ECOZONA.2020.11.2.3468
- Ghosh, A. (2016). "The great derangement," in *Climate Change and the Unthinkable*. Chicago and London: Chicago University Press.
- Haraway, D. (1988). Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective. *Fem. Stud.* 14, 575–599. doi: 10.2307/3178066
- Haraway, D. (2015). Anthropocene, capitalocene, plantationocene, chthulucene: making kin. *Environ. Human.* 6, 159–165. doi: 10.1215/22011919-3615934
- Haraway, D. J. (2016). *Staying with the Trouble: Making Kin in the Chthulucene*. Durham and London: Duke University Press.
- Higgins, D., Somervell, T., and Clark, N. (2020). Introduction: environmental humanities approaches to climate change. *Humanities* 9, 1–9. doi: 10.3390/h9030094
- Horn, A., Urias, E., and Zweckhorst, M. B. M. (2022). Epistemic stability and epistemic adaptability: interdisciplinary knowledge integration competencies for complex sustainability issues. *Sustain. Sci.* 1–8. doi: 10.1007/s11625-022-01113-2
- Hulme, M. (2009). *Why We Disagree about Climate Change: Understanding Controversy, Inaction and Opportunity*. Cambridge: Cambridge University Press.
- Intergovernmental Panel on Climate Change (IPCC) (2021). *Climate Change 2021: The Physical Science Basis. Working Group I contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. Cambridge, UK: Cambridge University Press. Available online at: [https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC\\_AR6\\_WGI\\_Full\\_Report.pdf](https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf) (accessed on June 27, 2022).
- Intergovernmental Panel on Climate Change (IPCC) (2022). *Climate Change 2022: Mitigation of Climate Change. Working Group III contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, UK: Cambridge University Press. Available online at: [https://report.ipcc.ch/ar6wg3/pdf/IPCC\\_AR6\\_WGIII\\_FinalDraft\\_FullReport.pdf](https://report.ipcc.ch/ar6wg3/pdf/IPCC_AR6_WGIII_FinalDraft_FullReport.pdf) (accessed on June 27, 2022).
- John, B., Caniglia, G., Bellina, L., Lang, D. J., and Laubichler, M. (2017). *The Glocal Curriculum. A Practical Guide to Teaching and Learning in an Interconnected World*. Available online at: <http://artrelated.net/sic/publication/9783933809308/the-glocal-curriculum-9783933809308.pdf> (accessed on August 31, 2022).
- Kolb, D. A. (1984). *Experiential Learning: Experience as the Source of Learning and Development*. New York, London: Englewood Cliffs, Prentice-Hall.
- Levin K, Cashore B, Bernstein S, Auld G. (2012). Overcoming the tragedy of super wicked problems: constraining our future selves to ameliorate global climate change. *Policy Sci.* 45, 123–152. doi: 10.1007/s11077-012-9151-0
- Nixon, R. (2011). *Slow Violence and the Environmentalism of the Poor*. Cambridge, Massachusetts and London: Harvard University Press.
- Perez Salgado, F., Van Herten, M., and Van Nieuwenhoven, E. (2020). "Literary analysis of Narratives from Lived Experiences of Climate Change in Higher Education," in *Presentation at the online international Narratives and Climate Change Conference, June 2020*. Netherlands: Open University of the Netherlands.
- Perez Salgado, F., Wilson, G., and Van der Klink, M. (2014). "Transforming academic knowledge and the concept of Lived Experience: Intervention Competence in an international e-learning programme," in: *2014 E-learning and sustainability in the series 'Environmental Education, Communication and Sustainability'*, eds S. Caeiro, W. Leal Filho, U. M. Azeiteiro (Frankfurt: Peter Lang Publishers), 59–69.
- Perez, P., Van Herten, M., and Van Nieuwenhoven, E. (2022). *Literary Analysis of Essays from Lived Experiences of Climate Change in Higher Education*. Interférences littéraires/littéraire interferences Special issue Narratives and Climate Change. Netherlands: Open University of the Netherlands
- Schneider-Mayerson, M. (2018). The influence of climate fiction. an empirical survey of readers. *Environ Hum.* 10, 2. doi: 10.1215/22011919-7156848
- Siegner, A., and Stapert, N. (2020). Climate change education in the humanities classroom: a case study of the Lowell school curriculum pilot. *Environ. Educ. Res.* 26, 511–531. doi: 10.1080/13504622.2019.1607258
- Siperstein, S., Hall, S., and LeMenager, S. (2016). *Teaching Climate Change in the Humanities*. Abingdon and New York: Routledge.
- Sipos, Y., Battisti, B., and Grimm, K. (2008). "Achieving Transformative Sustainability Learning: Engaging Head, Hands and Heart." *Int. J. Sustain. High. Educ.* 9, 68–86. doi: 10.1108/14676370810842193
- UNESCO (2017). *Changing Minds not the Climate*. Available online at: <https://unesdoc.unesco.org/ark:/48223/pf0000245977> (accessed June 27, 2022.).
- Weik von Mossner (2016). "Imagining geological agency: storytelling in the anthropocene," in *RCC Perspectives, No. 2, WHOSE ANTHROPOCENE? Revisiting Dipesh Chakrabarty's "Four Theses"*, 83–88.
- Wiek, A., Withycombe, L., and Redman, Ch.L. (2011). Key competencies in sustainability: a reference framework for academic program development. *Sustain. Sci.* 6, 203–18. doi: 10.1007/s11625-011-0132-6
- Wilson, G., Abbott, D., de Kraker, J., Pérez Salgado, F., Terwisscha van Scheltinga, C., and Willems, P. (2011). The lived experience of climate change: creating open educational resources and virtual mobility for an innovative, integrative and competence-based track at Masters level. *Int. J. Technol. Enhanced Learn.* 3, 111–123. doi: 10.1504/IJTEL.2011.039396