University for the Future, the Future for Universities: Learning Communities that Prioritize Care

Saskia D.M. van Schaik[1] iD, Jan Bransen[1,2],
Aleksi Neuvonen[3] iD, Björn Müller[4] iD, Laura Riuttanen[5] iD,
Merla Kubli[6,7] iD, Robert John Millar[8] iD, Antti Rajala[9] iD,
Ágnes Zsóka[10] iD and Peter Ache[11] iD

Abstract

Both current and future global emergencies call for vast transformations of humanity. While this has been known for decades, the challenge of acting upon it remains. Even within academia, a growing body of articles has advocated for both higher education for sustainability as well as transdisciplinary research, yet most universities and academics struggle to change their 'business as usual'. This article discusses how universities can and should support societal transformations through positioning care for all forms of life at their core as education and research institutes. Prioritizing care implies a different focus for universities, including a different concept of learning and development, namely one in which the world is continuously shaped and reshaped by all its inhabitants. Furthermore, this raises various ethical dilemmas, particularly when care for human life implies harm to non-human life. We review how the importance of reframing the knowledge-action gap by seeing learning as a process of action, which should happen in context and together, should be central in universities for the future. Last, we discuss two possible steps that can be taken today, namely (a) building co-creation labs and (b) integrating a sustainability mindset,

[1]Radboud University, Philosophy of Behavioural Science, Nijmegen, the Netherlands
[2]Radboud University, Radboud Teaching and Learning Centre, Nijmegen, the Netherlands
[3]Tampere University of Technology, Tampere, Finland
[4]University of Bern, Centre for Development and Environment (CDE), Bern, Switzerland
[5]University of Helsinki, Institute for Atmospheric and Earth System Research, Helsinki, Finland
[6]University of St. Gallen, Institute for Economy and the Environment, St. Gallen, Switzerland
[7]Delft University of Technology, Faculty of Technology, Policy and Management, Delft, the Netherlands
[8]Aalto University School of Electrical Engineering, Espoo, Finland
[9]Institute of Psychology and Education, University of Neuchâtel, Switzerland
[10]Corvinus University of Budapest, Institute of Sustainable Development, Budapest, Hungary
[11]Institute of Management Research, Radboud University, Nijmegen, the Netherlands

Corresponding author:
Saskia D.M. van Schaik, Radboud University, Philosophy of Behavioural Science, Postbus 9104, Nijmegen 6500 HE, the Netherlands.
E-mail: saskia.vanschaik@ru.nl

content and actions in the curriculum of all disciplines to enable all disciplines to contribute to addressing planetary challenges. Some universities have well-integrated such transdisciplinary, transgressive and transformative practice within their research and education. However, in most universities, the usual disciplinary business is hard to transgress and these steps could form a start that supports building learning communities that prioritize care.

Keywords

Academia, ecopedagogy, education for sustainability, higher education, knowledge-action gap, learning in context, pedagogy, transdisciplinary education

Introduction

While the world as we know it is transforming due to planetary emergency challenges, all citizens' everyday ways of living and being are questioned (Arias et al., 2021; Hoegh-Guldberg et al., 2019; Trisos et al., 2020). The major challenges the current planetary emergencies pose require an unprecedented pace and depth of changes to humanity; a transformation towards sustainable ways of inhabiting the planet. Several scholars have argued that universities should lead this social transformation towards sustainability by default and not by catastrophe. However, what this means for the role of universities in this transformation, and how they could take this lead, remains unclear and needs debate (Bradbury et al., 2019; Lemons, 2011; Thierry et al., 2023). More specifically, on the one hand, a growing body of research is repeatedly arguing for whole-system redesign and transformation, whereas on the other, most universities and most academics remain settled in their 'business as usual' (Lotz-Sisitka et al., 2015; Thierry et al., 2023).

This contradiction is also noticeable in the public debate surrounding the role of universities. For example, since Radboud University in the Netherlands launched a campaign against overconsumption and has continued launching campaigns about planetary crises, this was met both with enthusiasm and criticism from insiders and outsiders. Critical opponents seemed to be mainly based on positivistic notions of science and argued that Radboud University's campaigns lacked objectivity, and universities should not aim to influence society (Vlooswijk, 2021). In contrast, according to Radboud University, enthusiastic responses embraced the notion that the university 'took a stand' towards influencing action (Radboud University, 2021). These opposing positions urge a thorough reflection and consensus on the role of universities. In this position article, an international group of researchers from natural sciences, social sciences and humanities suggests their co-created position about the future for universities and practical steps that can be taken to build a university for the future. In line with a growing number of colleagues, we propose that universities are the right institutions to proactively support the aforementioned transformation towards sustainability. However, we shall argue that this is only possible through reflecting on the knowledge-action gap and suggesting a different notion of learning.

So how could universities support the transformation towards sustainable ways of living? First of all, we propose that instead of trying to bridge the knowledge-action gap, this challenge should be reframed. Reframing this challenge calls for redefining the concept of learning and the focus of universities. Often, transdisciplinary, transgressive approaches to research or education imply a different notion of learning and, therefore, a different notion of both knowledge and action without explicitly addressing these. We perceive that the focus and mindset of universities should be built upon the notion that all forms of life are continuously shaping the world together and that this continuous shaping can be defined as learning (Dewey, 1958; van Dijk, 2021). Learning in this sense means creating an openness and engagement between all actors involved, while shaping the world together. If learning means co-creating an indeterminate world, then learning also implies being responsible for our own learning as well as for the indeterminate world that we are shaping together.

Based on this notion of learning, and following Harcourt (2018, 2021), we suggest a change from the current socio-economic focus to a socio-ecological focus prioritizing care. In line with Harcourt, we define learning and sustainability as 'Care: Care for all forms of life, socially and naturally'. This pedagogy of care is also described by Whyte et al. (2016) as an ethics of caring in which they emphasize how deep connections and moral commitments between humans and non-humans can guide environmental science and decision making. These connections transcend boundaries of space and time, as humans should care for life near and far as well as in the present, past and future. They describe 'care ethics' as being grounded in virtues, practices and knowledge centred on caring for ourselves, others and the planet. We propose to transform universities into learning communities, prioritizing care for all forms of life.

Here, we will first discuss the knowledge-action gap and why reframing this challenge and focusing on redefined learning and prioritizing care are needed in dealing with major global problems. We will then discuss the crucial elements of the university for the future as a learning community: learning through action, learning together and learning in context. These three elements, both separately and combined, hold strong implications for the make-up of the university for the future. We end our contribution by suggesting two steps particularly universities and academics could take now to work towards becoming a university for the future, particularly for academics whose faculties or universities are still in a 'business as usual' mode and are in search of a transformation of their role.

Reframing the Challenge: Knowledge-action Gap

To understand how universities could support the transition to sustainable ways of living, we need to reflect on the purpose or role of universities and their conceptualization of knowledge. While knowledge about the various kinds of emergencies our planet is facing has increased during the last decades, action is not increasing rapidly enough, and change is yet to come (Fazey et al., 2021; Kollmuss & Agyeman, 2002; Latour, 2017; Shrivastava et al., 2020). Universities have played

a critical role in building this knowledge as well as creating solutions—especially technological and economic—needed in mitigating climate change (Knutti, 2019; Kulmala et al., 2021). The lack of change could imply that the kind of knowledge currently built by universities, and the role universities have played in building this knowledge, is exactly the kind of knowledge and the kind of role that fuels a knowledge-action gap (Latour, 2017; Maxwell, 1984; Urai & Kelly, 2023).

In addition, existing knowledge systems are exactly the systems that, on the one hand, have led to major advances and, on the other hand, have produced phenomena that potentially bring harm to forms of life, human and non-human (Fazey et al., 2020, 2021). While the bringing of harm is rarely intentional, probably equally rare is the intention to integrate care for human and non-human life. This is often attributed to a lack of integrated and inclusive knowledge entailing ethical considerations, transdisciplinarity and creativity (Witjes et al., 2022). From a socio-ecological focus, the knowledge systems that currently dominate our societies, stemming from a mechanistic paradigm, are not aligned with the ethics of caring (Latour, 2017; Whyte et al., 2016). Care implies action. And so does learning. We see an opportunity here: the challenge of a knowledge-action gap could very well be the challenge to reconceptualize knowledge or action. Rather than thinking of universities as places where knowledge is produced, we may emphasize that they are places where learning is encouraged. Encouraging learning requires care, care for open and exploring minds, students who are not in the business of controlling and manipulating the material world, but who are adapting themselves to an indeterminate world, continuously and mutually reshaping their relationship with this world.

This resonates with the suggestion of, for instance, Maxwell (2021) and Vogt and Weber (2020) that instead of building knowledge, universities should build wisdom and overcome the dualism between science and society. The notion of all forms of life continuously shaping the world puts this dualism between science and society in a different perspective. While shaping the world, researchers are more than merely observers; they are active participants in the world like all forms of life. That would mean that universities and their actors are continuously learning through their own actions and interactions with the rest of their learning communities. The concept of continuously co-creating or co-shaping the world aligns well with transdisciplinary research, in which researchers co-create across disciplines and in learning communities (Witjes et al., 2022).

We value learning communities as we perceive learning and a learning attitude as an attitude that embraces the dynamic indeterminacy that is entailed in our ever-changing, developing relationship with the world as a field of opportunities (Dewey, 1958; van Dijk, 2021). Both in teaching and in research, universities for the future should practise learning and a learning attitude. As our knowledge of the world and our acquaintance with the world are intrinsically provisional, we should practise our capacity to engage critically with truth claims, even if we are the ones making the claims. We view learning as the continuous action of shaping the world together, embracing indeterminacies and questioning, and mutually defining direction with care and responsibility (Giesenbauer & Müller-Christ, 2020; Renn, 2019; Urai & Kelly, 2023; Vogt & Weber, 2020). In universities, this should entail a dialogically

consistent valuation of and reflection on available knowledge and an engagement with all perspectives on the diverse dilemmas that major problems raise, while taking into account the context in which those problems are placed (Vogt & Weber, 2020). As such, learning is an interdependent process of continuously shaping the world together through engaged understanding, which lies a responsibility to try and take care of the world we are a part of and of all its inhabiting forms of life (van Dijk, 2021). The continuous critical reflection and posing of questions are precisely what make universities excellent institutions to catalyze change in the societies they are a part of, while including all diverse perspectives on dilemmas of change, such as the ecological, social, economic, cultural and sustainable perspectives. Of course, this includes a critical appreciation of academic standards that aim to warrant the quality of our knowledge claims (Maxwell, 2021; Vogt & Weber, 2020). By embracing a learning attitude in an ever-changing world, we propose that universities of the future should form communities of transformative learning for action. In these transdisciplinary communities, we hope to emphasize learning (a) through action, (b) in context and (c) together.

Action as Learning

As part of a socio-ecological focus and prioritizing care, we adopt an enactivist account of cognition (Varela et al., 1991). We believe that the future of universities should not predominantly be engaged in the accumulation of what the Greeks called *episteme*—a disengaged body of theoretical knowledge—but have a major interest in the growth of what the Greeks called *phronesis*—practical wisdom (Flyvbjerg, 2011; Maxwell, 1984). Such wisdom flourishes in communities of learning and practice that empower their members to critically examine dysfunctional habits and to replace them with more promising competencies. This requires a shared interest in the bigger picture, a pedagogical and educational safe zone to investigate one's entitlements, attitudes and vulnerabilities, and a lifelong willingness to learn and unlearn, that is, to make explicit, disrupt, revise, transform and reinforce communal patterns of responding to ignorance, ambiguity, confusion, misunderstanding and the 'wicked problems' these might entail (Bransen, 2017). This active learning supports competent agency for sustainability; it is an agency to care for all forms of life while shaping the world.

Building on this enactivist account of cognition, we suggest universities should become sites of transformative science and education that turn relevant climate knowledge into practical wisdom and test practical wisdom to enhance climate knowledge, together leading to context-sensitive know-how, climate competencies, and direct and indirect actions. To do this, our notions of practices of knowledge creation need to be updated (Wills & Lake, 2020). Instead of mostly building and transmitting theoretical knowledge for the purpose of scientific enhancement, universities should co-create transformative knowledge and education for the purpose of global enhancement. Furthermore, a university that learns through action, both in science and in teaching, is a university that learns in context. We propose that universities for the future are universities of co-creation for climate action in context.

Learning in Context

By learning in context, we mean that science for climate action should be science that builds both localized global and globalized local knowledge, know-how and actions. The academic network has expanded greatly in the last decades, including vast increases in international collaborations. Through various outlets, scientists across the planet learn from each other and with each other. However, due to the globalization of science, knowledge based on local assumptions has been spread widely and presented as universal, while neglecting the locality and specificity of the phenomena under study. Particularly in social sciences, during the past decades, criticism has been voiced about false assumptions of universality based on specific samples (Henrich et al., 2010; Scheidecker et al., 2024). Recently, the culture and human development approach has gained ground, in which development is studied in context and in interaction with the context (Harkness & Super, 2020; Jensen, 2015). The culture and human development approach is by definition transdisciplinary, as it often combines anthropological, psychological or educational theories and methods (Harkness & Super, 2020). Through studying culture and human development, existing theories in social sciences are broadened and deepened (Jensen, 2015), and, as such, local knowledge enhances global science and development, and global knowledge could inform local knowledge and action. The future for universities should prioritize such building of localized global climate knowledge, know-how and actions by building co-creation labs. Co-creation labs are exemplary for learning through action and learning in context.

Particularly, climate know-how evolve in co-creational settings engaging students, researchers, and various types of stakeholders in a specific context (Souza et al., 2019). This co-creation could generate mutual understanding—transdisciplinary and multi-actor—of global and local sustainability challenges and produce collective climate action know-how in the form of blueprints, ideas and experimental plans for transformative climate action. Climate know-how emerge when research-based climate knowledge is co-constructed with the surrounding society, its structures, path dependencies, belief systems and existing practices in co-creation labs. As such, contextualized climate know-how could represent some knowledge from the terrestrial perspective as discussed by Latour (2018). Furthermore, co-creation labs enable communities of citizens and scientists to become engaged and empowered to co-create context-relevant know-how and actions for behavioural, social and cultural changes—for a fair and inclusive transition, leaving no one behind. These contextualized co-creations entail learning through action, learning in context and, perhaps most importantly in the current planetary emergencies: learning together.

Learning Together

Ambitious cross-cutting, contextualized action learning has been linked to Maturana's relational approach to learning and Paulo Freire's concept of critical pedagogy, theories in which learners create their own developmental pathways

through interactions (Souza et al., 2019). In other words, learning together means assigning value to knowledge, know-how and competencies from all participants in the process of learning, regardless of their position as learners, teachers or scientists (Bransen, 2021). By assigning value to the perspectives of all participants in the process of learning, climate co-creation labs will have to cross the boundaries of disciplines, age or academic status and create a space for dialogue. Only in this space for dialogue can learners reflect upon their knowledge, know-how and competencies, and collaboratively act for sustainability. Through creating a dialogue across those boundaries, scientists, teachers and learners learn together. This learning together, while acting together, is based on meaning and intention. As Souza et al. (2019) explain, acting for sustainability is more than simply 'doing stuff', it is built on immaterial aspects of sustainability, for example, reflection, care, compassion and community. Through discussing a relational approach to collective problem-solving of local issues in a Brazilian urban community, Souza et al. set an example for the university for the future. In this example, they combine the focus on learning as action and local co-creation with care, responsibility and dialogue.

Besides the necessity of creating a space for dialogue, increasing evidence is found for the importance of communities of learning for climate action as opposed to an individual behaviour change paradigm (Wolske et al., 2020). Climate action mostly takes place in communities, on the one hand, because people search for peers with similar beliefs and behaviours, on the other, because people influence their peers to have similar beliefs and behaviours (Geiger et al., 2019). By choosing a socio-ecological focus, sustainability means prioritizing care for all forms of life, socially and naturally. Therefore, part of acting for sustainability is building a mindset based on care, compassion, concern and responsibility (Harcourt, 2018; Souza et al., 2019; van Dijk, 2021). Altogether, in the university for the future, climate science for action should address learning together as much as learning in context and in action. Co-creation labs provide excellent opportunities for such learning communities.

University for the Future: Taking Steps Today

Through learning together, in context and in action, universities for the future could truly constitute *an agora*: an intermediary public space of action for the transformation of communities, where personal concerns for the collective planetary emergencies are translated into community approaches to test, negotiate and develop public actions and solutions. Instead of perceiving an agora as a meeting place for some men, our agora is a place of dialogue for all, in which people share responsibility, care and action for the sustainability of all forms of life. Through the most elaborate global network of academia, these community approaches help build localized global knowledge for actions. Two steps that help constitute the new agora are (a) the development of co-creation labs based on a socio-ecological focus and (b) including a sustainability mindset, content and actions to mitigate planetary emergencies in all disciplines.

We suggest that in universities for the future, co-creation spaces could be based on the three elements: learning for action, in context and together. In these co-creation labs, local planetary challenges are met through dialogue and collaborative action between scientists, their students and the local communities. Co-creation labs must be transdisciplinary. Due to the impact and responsibility of human intent and actions, we agree with Latour that climate science and sustainability science could be seen as a variety of anthropology (Latour, 2018), particularly in the Anthropocene. In order to face major problems and catalyze a green transition, human beings and their specific mindset, value orientations and actions are at play. To be able to intervene in the causal process of planetary emergencies, we need to study this process from a natural, social and humanities perspective. Most climate sciences, whether focused on the biosphere or atmosphere, are increasingly becoming transdisciplinary in order to fundamentally understand the processes behind climate change, air quality and high-impact weather phenomena, as well as many other topics of current societal importance (Kulmala et al., 2021). The multidisciplinarity of the various planetary emergencies stresses the need for transdisciplinary research and educating a next generation of citizens, including scientists, with a truly transdisciplinary way of thinking. As societies are undergoing a deep low-carbon transformation, there is a need for a profound change in education and curricula in all study fields and study levels, from schools to universities and beyond to lifelong learning (Wals & Benavot, 2017). Through installing co-creation labs as institutes of collaborative science and learning, this change in education and its curricula is supported.

As a second step, we propose that in all universities, a sustainability mindset and content become a baseline in all study fields (Thierry et al., 2023). Apart from programmes dedicated to sustainability and climate change, there is still little sustainability education available in most universities. In fact, in many study programmes in traditional fields of social sciences, natural sciences and engineering, sustainability and climate change are only vaguely included or, if at all, superficially mentioned as grand challenges and trends of the future, without deeper analysis or reflection on the present and how these challenges relate to the study field in question (Riuttanen et al., 2021). While many university students, faculty, alumni and other professionals are ready and willing to contribute to strong climate mitigation and adaptation as citizens (Zsóka et al., 2013), they are missing the tools or need encouragement and allies to mobilize changes in prevailing social practices and institutions, as well as in disciplines still negligent towards the climate emergency.

Coda

An unfortunate example of this lack of interest and lack of transdisciplinarity is the personal experience of one of the authors, that a colleague in academia's response was blatantly discouraging when the topic of sustainability was raised as a potential research and education interest; it was brushed away as a personal hobby not fitting the specific discipline. Such a response, exemplary of many

researchers' and students' experiences, is one of the reasons for writing this position article. Quite the opposite, and another reason for writing this article, is the positive experience of the Climate University in Finland, which has been able to combine the forces of 29 higher education institutes in Finland to co-produce and share joint online education for sustainable societies on the planet. For example, the multidisciplinary Climate.now course is currently available for all students of these higher education institutes in Finland (Riuttanen et al., 2021). A further encouraging example is the master's certificate in Managing Climate Solutions (MaCS-HSG) at the University of St. Gallen in Switzerland. In the certificate programme, students from 13 different master's programmes come together to learn the fundamentals of climate change and translate this newly gained knowledge into action. In the course *Multidisciplinary perspectives on climate solutions*, the students develop and implement solutions for climate change in teams right in their local environment—the university and surrounding region, enabling learning through action, in context and together.

One way of building your sustainability mindset and content within university programmes is learning from academics and programmes who are working in transdisciplinary co-creative forms or have implemented education for sustainability. Among the academics we refer to in this article are plenty of examples that could be helpful when exploring co-creation or a curriculum for sustainability. In addition, Facer (2020) proposes steps towards collective learning that could be helpful. As she suggests, building such transdisciplinary co-creation is not easy and requires a thorough reflection on the role of universities from both academics and society. This was clearly illustrated by the opposing positions at the beginning of this article. Within academia, Urai and Kelly (2023) suggest forms of opening dialogue about this role. In this article, we have tried to open such a dialogue.

In sum, we argued that the world is indeterminate by nature, and universities for the future should re-conceptualize learning to match this indeterminate nature. As such, universities should continuously bring together transdisciplinary learning communities that breathe an ethics of care for all forms of life. In these transdisciplinary communities, we hope to emphasize learning (a) through action, (b) in context and (c) together. We proposed to start by including a sustainable mindset, sustainability knowledge and action in all study fields, and activate this in transformative pedagogies open to dialogue and co-creation with other societal actors. In other words, universities should help transform the world to what it could be: learning communities prioritizing care for a sustainable life, human and non-human.

Declaration of Conflicting Interests

Funding

ORCID iDs

Saskia D.M. van Schaik iD https://orcid.org/0000-0002-1716-8163
Aleksi Neuvonen iD https://orcid.org/0000-0002-5781-0878
Björn Müller iD https://orcid.org/0009-0009-9683-1856
Laura Riuttanen iD https://orcid.org/0000-0001-9549-6739
Merla Kubli iD https://orcid.org/0009-0007-3948-3491
Robert John Millar iD https://orcid.org/0000-0002-1704-0354
Antti Rajala iD https://orcid.org/0000-0001-8212-6325
Ágnes Zsóka iD https://orcid.org/0000-0001-6938-5277
Peter Ache iD https://orcid.org/0000-0002-8742-6471

References

Arias, P., Bellouin, N., Coppola, E., Jones, R., Krinner, G., Marotzke, J., Vaishali, N., Matthew, P., Gian-Kaspar, P., Joeri, R., Maisa, R., Jana, S., Trude, S., Peter, T., Blair, T., Krishna, A., Bhupesh, A., Richard, A., Kyle, A., … Zickfeld, K. (2021). *Climate change 2021: The physical science basis. Contribution of working group I to the sixth assessment report of the intergovernmental panel on climate change; Technical summary*. IPCC.

Bradbury, H., Waddell, S., O'Brien, K., Apgar, M., Teehankee, B., & Fazey, I. (2019). A call to action research for transformations: The times demand it. *Action Research*, *17*(1), 3–10.

Bransen, J. (2017). *Don't be fooled. A philosophy of common sense*. Routledge.

Bransen, J. (2021). *Homo educandus. Why our school system is broken and what we can do about it*. Radboud University Press.

Dewey, J. (1958). *Experience and nature*. Dover Publications.

Facer, K. (2020). *Beyond business as usual: Higher education in the era of climate change*. Higher Education Policy Institute.

Fazey, I., Hughes, C., Schäpke, N. A., Leicester, G., Eyre, L., Goldstein, B. E., Hodgson, A., Mason-Jones, A. J., Moser, S. C., Sharpe, B., & Reed, M. S. (2021). Renewing universities in our climate emergency: Stewarding system change and transformation. *Frontiers in Sustainability*, *2*, 677904.

Fazey, I., Schäpke, N., Caniglia, G., Hodgson, A., Kendrick, I., Lyon, C., Page, G., Patterson, J., Riedy, C., Strasser, T., Verveen, S., Adams, D., Goldstein, B., Klaes, M., Leicester, G., Linyard, A., McCurdy, A., Ryan, P., Sharpe, B., … Young, H. R. (2020). Transforming knowledge systems for life on Earth: Visions of future systems and how to get there. *Energy Research & Social Science*, *70*, 101724.

Flyvbjerg, B. (2011). *Making social science matter: Why social inquiry fails and how it can succeed again*. Cambridge University Press.

Geiger, N., Swim, J. K., & Glenna, L. (2019). Spread the green word: A social community perspective into environmentally sustainable behavior. *Environment and Behavior*, *51*(5), 561–589.

Giesenbauer, B., & Müller-Christ, G. (2020). University 4.0: Promoting the transformation of higher education institutions toward sustainable development. *Sustainability, 12*(8), 3371.

Harcourt, W. (2018). White settler colonial scientific fabulations on otherwise narratives of care. *In Feminist political ecology and the economics of care* (pp. 36–54). Routledge.

Harcourt, W. (2021). Rethinking life-in-common in the Australian landscape. *Environment and Planning E: Nature and Space*, *4*(4), 1330–1345.

Harkness, S., & Super, C. M. (2020). Culture and human development: Where did it go? And where is it going? *New Directions for Child and Adolescent Development*, *2020*(173), 101–119.

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences*, *33*(2–3), 61–83.

Hoegh-Guldberg, O., Jacob, D., Taylor, M., Guillén Bolaños, T., Bindi, M., Brown, S., Camilloni, I. A., Diedhiou, A., Djalante, R., Ebi, K., Engelbrecht, F., Guiot, J., Hijioka, Y., Mehrotra, S., Hope C., W., Payne, A. J., Pörtner, H.-O., Seneviratne, S. I., Thomas, A., . . . Zhou, G. (2019). The human imperative of stabilizing global climate change at 1.5°C. *Science*, *365*(6459), eaaw6974.

Jensen, L. A. (Ed.). (2015). *The Oxford handbook of human development and culture: An interdisciplinary perspective*. Oxford Library of Psychology.

Knutti, R. (2019). Closing the knowledge-action gap in climate change. *One Earth*, *1*(1), 21–23.

Kollmuss, A., & Agyeman, J. (2002). Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research*, *8*(3), 239–260.

Kulmala, M., Lintunen, A., Ylivinkka, I., Mukkala, J., Rantanen, R., Kujansuu, J., Petäjä, T., & Lappalainen, H. K. (2021). Atmospheric and ecosystem big data providing key contributions in reaching United Nations' sustainable development goals. *Big Earth Data*, *5*(3), 277–305.

Latour, B. (2017). *Facing Gaia. Eight lectures on the new climate regime*. Polity Press.

Latour, B. (2018). *Down to Earth: Politics in the new climatic regime*. Polity Press.

Lemons, J. (2011). The urgent need for universities to comprehensively address global climate change across disciplines and programs. *Environmental Management*, *48*(3), 379–391.

Lotz-Sisitka, H., Wals, A. E., Kronlid, D., & McGarry, D. (2015). Transformative, transgressive social learning: Rethinking higher education pedagogy in times of systemic global dysfunction. *Current Opinion in Environmental Sustainability*, *16*, 73–80.

Maxwell, N. (1984). *From knowledge to wisdom: A revolution in the aims and methods of science*. Blackwell.

Maxwell, N. (2021). How universities have betrayed reason and humanity—And what's to be done about it. *Frontiers in Sustainability*, *2*, 18.

Radboud University. (2021). Results Radboud recharge: Sustainability in education. https://www.radboudrecharge.nl/en/article/sustainability-in-education?utm_source= impactdaycampagnepagina&utm_medium=unpaidlink&utm_campaign=impactday

Renn, O. (2019). Die Rolle (n) transdisziplinärer Wissenschaft bei konfliktgeladenen Transformationsprozessen. *GAIA-Ecological Perspectives for Science and Society*, *28*(1), 44–51.

Riuttanen, L., Ruuskanen, T., Äijälä, M., & Lauri, A. (2021). Society needs experts with climate change competencies—What is the role of higher education in atmospheric and Earth system sciences? *Tellus B: Chemical and Physical Meteorology*, *73*(1), 1–14.

Scheidecker, G., Tekola, B., Rasheed, M., Oppong, S., Mezzenzana, F., Keller, H., & Chaudhary, N. (2024). Ending epistemic exclusion: Toward a truly global science and practice of early childhood development. *The Lancet Child & Adolescent Health*, *8*(1), 3–5.

Shrivastava, P., Smith, M. S., O'Brien, K., & Zsolnai, L. (2020). Transforming sustainability science to generate positive social and environmental change globally. *One Earth*, *2*(4), 329–340.

Souza, D. T., Wals, A. E., & Jacobi, P. R. (2019). Learning-based transformations towards sustainability: A relational approach based on Humberto Maturana and Paulo Freire. *Environmental Education Research*, *25*(11), 1605–1619.

Thierry, A., Horn, L., Von Hellermann, P., & Gardner, C. J. (2023). "No research on a dead planet": Preserving the socio-ecological conditions for academia. *Frontiers in Education*, *8*, 1237076.

Trisos, C. H., Merow, C., & Pigot, A. L. (2020). The projected timing of abrupt ecological disruption from climate change. *Nature*, *580*(7804), 496–501.

Urai, A. E., & Kelly, C. (2023). Rethinking academia in a time of climate crisis. *Elife*, *12*, e84991.

van Dijk, L. (2021). Psychology in an indeterminate world. *Perspectives on Psychological Science*, *16*(3), 577–589.

Varela, F., Thompson, E., & Rosch, E. (1991). *The embodied mind: Cognitive science and human experience*. MIT Press.

Vlooswijk, E. (2021, November 16). Sinds wanneer is een universiteit een influencer die je koopschaamte aanpraat? *De Volkskrant*. https://www.volkskrant.nl/columns-opinie/sinds-wanneer-is-een-universiteit-een-influencer-die-je-koopschaamte-aanpraat~b70f655c/

Vogt, M., & Weber, C. (2020). The role of universities in a sustainable society. Why value-free research is neither possible nor desirable. *Sustainability*, *12*(7), 2811.

Wals, A. E., & Benavot, A. (2017). Can we meet the sustainability challenges? The role of education and lifelong learning. *European Journal of Education*, *52*(4), 404–413.

Whyte, K. P., Cuomo, C. J., Gardiner, S. M., & Thompson, A. (2016). Ethics of caring in environmental ethics: Indigenous and feminist philosophies. In S. Gardiner & A. Thompson (Eds.), *The Oxford handbook of environmental ethics* (pp. 234–247). University Press.

Wills, J., & Lake, R. (2020). *The power of pragmatism: Knowledge production and social enquiry*. Manchester University Press.

Witjes, S., Ahlström, H., Vildasen, S., & Ramos, M. (2022). Academics for sustainable development: Exploring consequences and dilemmas of transdisciplinary research approaches. *Sustainable Development*, *30*(2), 289–292. https://doi.org/10.1002/sd.2254

Wolske, K. S., Gillingham, K. T., & Schultz, P. W. (2020). Peer influence on household energy behaviours. *Nature Energy*, *5*(3), 202–212.

Zsóka, Á., Szerényi, Z. M., Széchy, A., & Kocsis, T. (2013). Greening due to environmental education? Environmental knowledge, attitudes, consumer behavior and everyday pro-environmental activities of Hungarian high school and university students. *Journal of Cleaner Production*, *48*, 126–138.

Authors' Bio-sketches

Saskia van Schaik is Assistant Professor of Philosophy of Behavioral Sciences and Pedagogical Sciences and Education. She adopts a culture and human development approach. This approach addresses learning and development in context, challenges normative assumptions and studies universalities and cultural specificities of learning.

Jan Bransen is an Emeritus Professor of philosophy of Radboud University. His main work has been on images of human self-understanding and the ways in which scientism distorts both these images and our self-understanding as humankind.

Aleksi Neuvonen (PhD) is the Co-founder of think tank Demos Helsinki. His research interests include futures research, transformative planning, political philosophy, anticipation studies and temporality of sustainability transformations.

Björn Müller is a Senior Research Scientist at the Center for Development and Environment, University of Bern, Switzerland. His main research interests are all tied to questions of societal transformation, ranging from social innovation, urban transitions and strategic design to transformative learning and pedagogies of hope.

Laura Riuttanen is a University Lecturer in atmospheric sciences at the University of Helsinki Institute for Atmospheric and Earth System Research. After her PhD in meteorology, she has researched and developed climate change education in Higher Education and in the society.

Merla D. Kubli is Assistant Professor of System Dynamics for Policy Analysis at the faculty of Technology, Policy and Management at TU Delft. Her research focuses on the business dynamics of climate solutions. In her prior appointment at the University of St. Gallen, she co-founded the master's certificate in Managing Climate Solutions and led the certificate for three years.

R. John Millar is a Researcher and Senior Lecturer at Aalto University, Finland. His main research interests are distribution network planning, transmission grid modelling, underground cable rating, pedagogical development and experientially grappling with questions such as, why is there anything?

Antti Rajala, Ph.D, is Professor of Sociocultural Psychology and Education at the Institute of Psychology and Education, University of Neuchâtel. Rajala's research interests include utopias in education, environmental education, global education, as well as learning, agency, and civic engagement.

Ágnes Zsóka is a Professor at Corvinus University of Budapest, Hungary. Her main research interests are: sustainable consumer behaviour, education for sustainability, corporate sustainability performance and its reporting.

Peter Ache, Prof em dr, is interested in strategic spatial planning and vision making, especially in metropolitan regions. The research extends to a broader interest in urban futures as result of lifestyle changes, technological advance, but also of norm setting and policy making. A particular concern relates to conflict as creative moment in strategy making.