

Helge Kminek

Education for Sustainable Development – An Aporetic Approach

Abstract

At the centre of this contribution is the assertion, and its justification, that education for sustainable development is an *aporetic* enterprise: something with enmeshed contradictions that are irresolvable. The developed argument is not for the abandonment of these aspirations, programme and practice of education for sustainable development; their necessity is itself part of the *aporia*. Instead, it argues for an alternative research approach that takes the *aporia* as its starting point.

Keywords: *Education for Sustainable Development, Critical Theory, Aporia, Theory Building, Research Approach*

Zusammenfassung

Im Zentrum des Beitrags stehen die These und ihre Begründung, dass Bildung für eine nachhaltige Entwicklung eine aporetische Unternehmung ist; also eine solche, die in Widersprüche verwickelt ist, die in ihr selbst liegen und unauflösbar sind. Mit der entfalteten Argumentation wird nicht für eine Verabschiedung des Anspruchs der Programmatik und der Praxis der Bildung für eine nachhaltige Entwicklung argumentiert. Denn deren Notwendigkeit gehört gerade selbst zur Aporie. Stattdessen wird für einen alternativen Forschungsansatz argumentiert, der die Aporie zum Ausgangspunkt nimmt.

Schlüsselworte: *Bildung für nachhaltige Entwicklung, kritische Theorie, Aporie, Theoriebildung, Forschungsansatz*

Introduction¹

The purpose of this article is to present the main lines of argumentation to, firstly, see if the claim that *Education for Sustainable Development* (ESD²) *should be an aporetic undertaking* is plausible³. So far, *both pedagogical ESD theory and ESD practice attempt to obscure or even negate the aporia*⁴. At first, this thesis may not be self-evident and, therefore, must be elucidated. According to the *Oxford English Dictionary*, the concept of an *aporia* was initially used to conceptualise a state of perplexity or difficulty. The origin of the word is the ancient Greek ὁ πόρος *ho poros*, and, according to this root, *aporia* means ‘without a way out, without a path.’ *Aporia* implies being in a place and wanting to leave, but the ability to do so is blocked or there is simply no way out. Hence ESD theory building (so far) – both on the normative question of how ESD should be carried out and the descriptive question of ESD practice and pedagogical

practice – needs a path or way out. However, this idea is not feasible in its general formulation. After all, it is not the case that there is no ESD theory formation and no ESD pedagogical practice; therefore, it seems that there are ways out. In order to maintain my initial thesis, I must justify that ESD theorising and ESD pedagogical practice appear as successful ways out of the *aporia*, but are in fact not. My argument would be particularly robust if I could show that there are systematic reasons why ESD cannot escape the situation of *aporia*.

Fundamentally, the present theoretical approach is based on Theodor W. Adorno's primary or epistemological considerations and his thesis on the “primacy of the object” (Adorno, 1966, p. 184ff). Here, the guiding principle of the primacy of the object means that the question of sustainable development (SD) must be addressed first; only then can education issues for SD be examined. Following Adorno, positively defined, this could unfold the *aporias* of human world relations as far as possible. But, negatively-defined, this could prematurely stop the unfolding of the *aporias* or their simplifications, whitewash or mitigate the *aporias* of human world relations. For a better understanding, and against the background of these considerations, my argument is presented as follows: (1) Human societies, especially those of so-called industrialised countries, must undergo a socio-ecological transformation of which the normative target perspective is called sustainable development. (2) A binding definition of sustainable development is necessary so that human societies can identify a target perspective for necessary socio-ecological transformation. (3) The definition of sustainable development is and must remain under-defined. If we consider these theses together, then an intermediate conclusion can be drawn and, for the continuation of the argument, this simultaneously produces a new thesis one and thesis two. Intermediate conclusion and new thesis (1): A target perspective of the necessary socio-ecological transformation for human societies cannot be determined in a strictly operationalised way because it is under-determined; however, at the same time, a binding definition is necessary. Intermediate conclusion and new thesis (2): Because, on the one hand, this transformation is necessary, but on the other, the target perspective cannot be determined in a binding way, humanity finds itself in an *aporetic* situation. (3) The theory and pedagogical practice of Education for Sustainable Development ignores or actively negates the *aporia*. Conclusion: Education for Sustainable Development should be seen as an *aporetic* undertaking, precisely because pedagogical ESD practice and

ESD theory attempt to obscure or even negate the *aporia*.

I will now mainly unfold the content of thesis one, two and three within the framework available here and argue for their plausibility. In these sections, I repeatedly indicate why educational ESD is dependent on reflection on these theses respectively. Thesis three is briefly negotiated in the last section of the paper by systematically highlighting educational research questions that arise from the argument presented. In further work, this thesis should be justified in detail.

On the necessity of a socio-ecological transformation with the normative target of sustainable development

Although, in the scientific community, but especially for ESD, the necessity of a corresponding socio-ecological transformation is hardly questioned, the original diagnosis should be briefly outlined as I will refer to the history of this research during the course of the argument. Rachel Carson presented an early example of this crisis diagnosis with the book *Silent Spring* (1962). Since then, scientific research into an unsustainable human-environment has expanded massively (Meadows, 1972; Wiegandt, 2022) with the establishment of new disciplines, such as Sustainability Science and Earth System Science (Ehlers & Krafft, 2006; Vries, 2013). More concretely, work is also being conducted on the scientific definition of planetary boundaries (Steffen et al., 2015). These boundaries mark the extent to which humanity has changed the biosphere – its basis for survival – so that forms of human life seen over the past millennia are no longer possible. According to recently conducted research, it is not yet possible to prevent these predicted negative developments from occurring. Moreover, based on the state of research in Earth System Sciences, tipping points in the earth system are already close to being reached and, as a result, planetary boundaries would be exceeded (Wang-Erlandsson et al., 2022). As research models are increasingly looking to the past to describe changes that have already taken place, they are becoming more assured. A transgression of the planetary boundaries threatens humanity in an unimaginable way. The example of environmental refugees is increasingly being adopted in the scientific disciplines, warning of societal collapse “on both sides of the migration movement” (Rahmsdorf, 2022, p. 30, translated by H.K.). This will likely be the consequence of, but not limited to, weather events that have been intensified or even caused by human-made climate change. Concerning this, experts tend to consider “a 3-degree world to be an existential threat to human civilisation” (Seppelt et al., 2022, p. 76, translated by H.K.). The latter statement could be judged as dramatic, emotional and even unacceptable for scientific argumentation. Particularly because, parallel to scientific research on the impact of human activity on the so-called natural foundations of human life and social-political environmental movements (Grasso & Giugni, 2022), a political discourse has developed around measures to avoid the destruction of these foundations (World Commission on Environment and Development, 1987; UN, 2023). Furthermore, the seventeen United Nations Sustainable Development Goals (SDGs), presented by the United Nations General Assembly on 25. September 2015, were adopted as an action plan to decelerate (as nobody believed in outright prevention) the ne-

gative developments outlined. Moreover, even though not everybody agrees with the necessity of a socio-ecological transformation with the goal of sustainability, a broad spectrum of the population and political actors – from conservative to progressive – support the idea as long as it is merely formal and void of content. What is politically controversial, however, is how the transformation is to be carried out and the relationship between different sub-goals. I want to conclude this sub-chapter with two quotes which underline the necessity and urgency of a socio-ecological transformation. Firstly, at Cop27⁵, UN Secretary-General António Guterres proclaimed that “We are on the highway to climate hell – with our foot on the accelerator” (The Guardian, 2022). Guterres’s quote exemplifies that humanity is on track to reach total climate catastrophe if it does not succeed in transforming into socio-ecologically sustainable societies. This transformation must materialise, but instead, humanity is speeding down the wrong path. However, even if there are specific solutions (WBGU, 2011), I cannot detail them in this paper. The failure to achieve the desired transformation is proof that “no one has the magic formula” (De Rivero, 2019, p. xi), despite decades of crisis diagnoses. Thus, this points precisely to an *aporetic* situation and leads me to thesis two and three.

About a binding definition of sustainable development

If one strives for change that is not arbitrary and diffuse, then a clear definition of these goals is needed. Only then is it possible to decide whether the goal has been reached or whether a decided measure or step has led to achieving the goal or not. However, arbitrariness can only be avoided with a binding definition that enables clear operationalisation. Otherwise, it remains unclear whether a development, a new process, new structures or alternative actions can be considered sustainable. This also means that a viable definition of ‘SD’ must not only be able to outline what is covered by the term ‘SD positively’, but also negatively – in the sense of excluding what is not covered by the term (Rist, 2019, p. 9f). Thus, the question is whether or not the definition of SD can be regarded as suitably distinctive. Such a definition is not only central to sustainability science but also ESD; however, for the latter, the definition of ‘SD’ is equally necessary because, without it, it cannot be determined whether an education practice contributes logically or stringently to SD or not. Moreover, any empirical study of ESD pedagogical practice remains diffuse if the question of ‘what’ has not been considered (i.e., the question of how to define SD). For this very reason, educational research on the theory and practice of ESD cannot avoid these questions. The definition from the 1987 Brundtland Report is often used as a guide to this day. The report states that “Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development, 1987, p. 15). Moreover, this was the guiding principle of the seventeen SDGs of the United Nations, referred to above. Discussing SDGs here is appropriate insofar as they are legitimised by the United Nations and thus politically worldwide and, due to this political legitimisation and their 169 tar-

gets, trillions of dollars are being invested to achieve these goals. In addition, numerous civil society actors (such as foundations and non-governmental organisations) are also committed to the SDGs. Political legitimacy and the estimated financial means to achieve these goals can strongly justify the existence of a binding definition for SD. However, there are numerous criticisms of both (1) the overarching definition of development – and, with a critique of the concept of development, sustainable development is simultaneously criticised – and (2) the seventeen SDGs. (1) A solid critique of the concept of (sustainable) development has been developed by Gilbert Rist (2019). Tracing the concept's history, Rist argues that the idea of development is nothing more than collective delusion. This delusion, he argues, only serves the expansion of market relations, i.e., economic growth. Rist's work questions, if slightly polemically, whether SD can exist at all: "In the name of this fetishistic term – which is also a portmanteau or 'plastic' word – schools and clinics are built, exports encouraged, wells dug, roads laid, children vaccinated, funds collected, plans established, national budgets revised, reports drafted, experts hired, strategies concocted, the international community mobilized, dams constructed, forests exploited, deserts reforested, high-yield plans invented, trade liberalized, technology imported, factories opened, wage-jobs multiplied, spy satellites launched. When all is said and done, every modern human activity can be undertaken in the name of 'developing'" (Rist, 2019, p.11). The Peruvian diplomat Oswaldo de Rivero argues more concretely, criticising the systematic content of sustainability discourse. His work spans from 'backward countries' to 'underdeveloped countries' and 'countries undergoing development' to 'developing countries.' However, for De Rivero, awareness of the problem of SD has not changed, even though terms and concepts have. Like Rist, he is unequivocal in his analysis and judgement that development (and, consequently, sustainable development) is a myth: "Theorists who cogitate about the wealth of nations and technocrats who specialize in formulating projects to increase production and raise living standards may be mistaken about to entertain the slightest doubt as to the chances of development itself. For them, to consider the impossibility of development is to think the unthinkable. [...] In this way, development was represented as a natural process, like a Darwinian evolutionary certainty – the backward countries were 'developing', using the genetic potential of any nation-state to turn itself into a society with high living standards. The myth of development was born" (De Rivero, 2019, p. 71). This analysis then leads him to argue that "[t]he myth of development has impregnated our civilization to such an extent as to inspire splendid, headstrong international stances such as the United Nations proclamation of the 'right to development', that is, the right of all underdeveloped countries to have living standards and consumption patterns like those of the industrialized states. The recognition of this right in United Nations declarations bears no relation to its real chances of becoming effective. Besides, its hypothetical achievement at present Western consumption levels would cause an environmental catastrophe on the planet" (De Rivero, 2019, p. 75). (2) In addition to critiques of the idea and concept of (sustainable) development, such as Rist and De Rivero's, there are a number of critiques that arise from the seventeen SDGs. To give one example, SDG goal eight aims at decent work and economic growth. Economic growth is usually based on using natural resources and is also dependent on energy, which

contributes to climate change. In order to ensure that goal eight can be achieved without clashing with goal thirteen ("Climate action"), economic growth that does not drive climate change is required. The concept of green growth claims to achieve the dual objective of economic growth with climate protection and is intended to decouple this growth from natural resources and, ultimately, its impact on the climate. However, there are considerable reservations about green growth. Parrique et al. (2019) consistently argues that, empirically, the concept has rarely been realised and, where it has, there were limitations on time and space. The authors then expand their argument and surmise that the feasibility of permanent, geographically comprehensive green growth is impossible in principle.

Why the definition of sustainable development is and must remain under-defined

Concerning the fact that this paper's argument is based on Theodor W. Adorno's philosophy, the assumption was implicitly made that *aporia* cannot be abolished, i.e., resolved. Thus, in a consistent negative dialectic (Adorno, 1966), it must be assumed that the outlined relationships to the *aporia* of SD also cannot be *aufgehoben* (abolished)⁶. This does not mean that the *aporia* cannot be dealt with, for better or worse, but it will always remain in some capacity. However, this only self-reflexively and thus self-critically reveals the premise of one's argument; to say that the definition of SD is and must remain under-defined it is not yet a robust enough thesis. On the one hand, it is supported by the consideration that, against the background of historical scientific research, it seems implausible that the development of human societies can, at some point, be terminated (Graeber & Wengrow, 2021). In addition, coming generations must have opportunities to shape their own lives though SD, otherwise it becomes a matter of structural oppression. Finally, given the long-term impact of humans on the biological basis of life, it is reasonable to assume that conceptual questions of SD will continue to concern many generations to come. Implicitly, Andreas Malm, points out that "[i]f one tonne is emitted in this second, a fourth of it will stay in the atmosphere for hundreds of thousands of years. If we wait some time longer and then demolish the fossil economy in one giant blow, it would still cast a shadow far into the future: emissions slashed to zero, the sea might continue to rise for many hundreds of years, the waters slowly expanding as the heat makes its way deeper and deeper into the oceans" (Malm, 2016, p. 8)⁷. Thus, we see that our "civilisation [...] operates in the same way as a cancerous cell that goes on destroying the organism off which it lives" (De Rivero, 2019, p. xi). It can be concluded that, because we see the possibility of self-destruction and the destruction of ecological foundations, humans are fundamentally capable of this. The question of whether humans are also capable of destroying themselves through the use of (nuclear) weapons is undoubtable. Thus, it is a task for humanity not to bring these negative outcomes to fruition. As this argument is coherent and correct in principle, the intermediate conclusions (see above) are justified and, if they are true, this has widespread consequences for theoretical positions of ESD. At first glance, theorising an *aporetic* situation seems identical to the discussion of wicked problems – a common argument in ESD theory contributions that reference these issues (Lotz-Sisitka & Lupele, 2017). Although I am unable to discuss the difference between wicked problems

and an *aporetic* situation in detail, in short, wicked problems can be solved and an *aporia* (in principle) cannot – it can only be worked on (for better or worse)⁸. In this article, I argue for an *aporetic* problem constellation; therefore, wicked problems seem factually inaccurate and, in consequence, only contribute by chance to the successful handling of the *aporia*. For the final section, I will now outline central educational science questions that arise from the approach sketched out here.

Research perspectives and questions for the approach presented here

What questions could arise from this approach? It may be asked how the approach presented here could be further substantiated. There are essentially two ways to achieve this: Firstly, by drawing on and discussing the perspectives of interdisciplinary bodies of knowledge that are external from educational science, the above conclusions (one and two) can be strengthened. Moreover, from an education science perspective, the argument can be enhanced by showing that, in analyses of (normative) ESD theory formation (Kminek & Wallmeier 2020) as well as pedagogical ESD practice, both are subject to the *aporia*, react to the *aporia* and do not make the *aporia* an issue. The latter variant, in particular, would require a scientific research project that questions the current basic assumptions of ESD research; for Toulmin, “it is always open to scientists to challenge the intellectual authority of the fundamental scheme of concepts within which they are provisionally working – the permanent right to challenge this authority being one of the things which [...] marks off an intellectual procedure as being ‘scientific’ at all” (Toulmin, 1970, p. 40). However, if this argument is correct, then education on ESD theory would have to be conceptualised differently. The *aporia* does not pose a problem for a normative theory of education, because the *aporia* – of which we as humans must assume we can work on through practice at least well enough to avoid the worst consequences – is itself an educational task and a task of *Bildung* respectively¹⁰. Consequently, this brings me to the second question: *How should ESD pedagogy be carried out, bearing in mind the aporia outlined above?* This normative question is to be discussed in terms of the philosophy of education and, due to its multi-faceted nature, contains numerous sub-questions. For example: What does and what should *Bildung*, in the sense of the subject-world relationship, mean today (Kminek et al., 2022)? In terms of shaping the human being, what processes of *Bildung* can be because of the *aporia*, and how should these processes be structured?¹¹ What is descriptively *Bildung* as the goal and purpose of human existence today, and what should be the goal and purpose of human existence today? How does and how should the ideal of *Bildung*, namely as an expression of the self-reflective and autonomous personality, manifest itself today? How should the institutional and historical dimension of *Bildung*, as individually and collectively becoming human, be described today, and what would this look like? How are processes of *Bildung* formed by the world and/or the individuals’ view of it? How does *Bildung* look to the individual?

These questions can, of course, also be divided into further questions on specific subjects. For example, the talk of an *aporetic* undertaking may seem pessimistic, when optimism could be necessary for the transformation. I do not deny that an optimistic

outlook is crucial for transformation – perhaps even essential – but this complex question would have to be the subject of a separate article. This paper is not closed off from normative arguments, but at the same time, “a clear view of empirical realities” (Blühdorn, 2020, p. 15, translated by H. K.) should not be lost for the sake of maintaining optimism. Instead, a clear view of empirical realities is necessary for the desired transformation.

However, this brief foray conceals many complex questions that do need to be addressed. In particular, this applies to the scientific understanding underlying this approach, which needs developing. The approach is consciously positioned between established discourse. It is a (educational) scientific observation, distanced from educational-philosophical theorising of ESD and avoids hasty activism (without rejecting the normative and consciously designed social-ecological transformation). For this purpose, it would be necessary to show argumentatively and in the sense of a normative theory of education which would be appropriate before the pedagogical ESD practice on the one hand, without pedagogisation, the social problems on the other (Proske, 2002)¹². Interestingly, the systems theorist Niklas Luhmann, who is not normally known for value judgements, seems to argue in a similar direction to the approach advocated here: “Consequently, there should be a pedagogy that prepares the offspring to be educated for a future that remains unknown. This is not only about the usual not knowing, about the need for information and the insight that one has to manage with little information because more information quickly overtaxes the cognitive capacities, but that is also: could no longer be converted into knowledge. That too, but the more important insight is that the unknown of the future is a resource, namely the condition of the possibility of making decisions. The consequence would be that the learning of knowledge would have to be replaced mainly by the learning of decision-making, i.e., of exploiting non-knowledge” (Luhmann, 2002, p. 198, translation by H. K.).

In addition to these questions, empirical studies would have to ask whether the thesis substantiated in this article is viable. In summary, this article demonstrates how a slight shift in the theoretical background assumptions, from wicked problems to an *aporetic* situation, foundationally questions ESD theory building and calls for a whole research programme to account for this.

Notes

- 1 I would like to thank Simone Blandford for the thorough editing and Jürgen Budde and Nina Blasse, as well as members of the colloquium Isabel Diehm and Wolfgang Meseth for the constructive advice.
- 2 In this paper, ESD is widely understood and used. Hence, the arguments developed here also apply in large part to related concepts, such as environmental and sustainability education, environmental education or global citizenship education – at least it appears this way to the author. ESD is used because it is probably the most frequently used term due to its educational designation by UNESCO.
- 3 The statement that the contribution claims to make the thesis seem plausible here is meant to indicate that it is worthwhile to pursue the idea further, to examine it and, if necessary, to reject the thesis.
- 4 The thesis can also be formulated as a research question: is ESD an *aporetic* undertaking? Whether one prefers to work with a thesis or research question makes no difference in my view.
- 5 COP27 is referring more commonly, in 2022, to ‘United Nations Climate Change Conference’ or ‘Conference of the Parties of the UNFCCC’.
- 6 The German verb *aufheben*, which is central to Hegel’s dialectical philosophy and subsequently to Adorno’s philosophy, does not have a clear translation into English.
- 7 A possible counter-argument is that sustainability means reducing emissions, regardless of the impossibility of determining the exact impact. This is true: Reducing emissions belongs to sustainable development without a doubt. But this is not yet

sufficient to determine sustainable development and, as a result, it remains undetermined.

- 8 In addition, this reminds us that educational theory building is not without presuppositions and that presuppositions significantly and fundamentally structure theory building. Thus, educational practice – if theory is understood here in a very broad sense – determines that every educator has a theory of their practice which is not monocausal but also influences their actions.
- 9 I.e., regardless of whether ESD is conceptually aligned with *Bildung* (ESD 1, regarding *Bildung* compare endnote 10) or with education (ESD 2 – regarding the concepts of ESD 1 and 2 see Vare & Scott, 2007) or whether both can be mediated with each other (see Albers, 2022).
- 10 “Bildung has no obvious English-language substitute. It has been translated variously as education, edification, formation, learning, culture, cultivation and literacy. Bildung was given canonical definition by Wilhelm von Humboldt as “the linking of the self to the world to achieve the most general, most animated, and most unrestrained interplay” (Humboldt, 1792, in Flitner & Giel, 1980, p. 58). In keeping with the breadth of this phrasing, Benner and Brügggen (2004) define Bildung as “the process of the forming (die Formung) of humans, as well as the determination (Bestimmung) of the goal and purpose of human existence” – further underscoring the vast, ill-defined semantic space that this term occupies in the German language. In addition, Bildung signifies the ideal of the autonomous, self-determined, and self-reflected personality in its full realization. But Bildung goes beyond this as well. Bildung cannot be completely contained by terms such as “education,” “socialization,” “instruction,” or “schooling”. Bildung identifies a kind of “becoming human” that spans biographical, the collective, institutional and historical dimensions. As such it opens up the possibilities of a generative process through which we are formed by the world, form ourselves, and form the world (immediately) around us. I would like to thank Norm Friesen for his first text template, to which I have strongly attached myself (see Friesen, 2021)” (Kminek, 2023).
- 11 To avoid misunderstandings, it would be urgent to pursue the question of what contribution *Bildung* in general and ESD in particular can make to social transformation. Comparatively undisputed, the contribution of *Bildung* – at least so far – is likely to be much smaller than hoped. It is not wishful to think that *Bildung* has any influence at all, as opposed to socialisation.
- 12 These sketchy remarks also indicate why the approach presented here is not based on the educational and theoretical conception of disciplinarity (Dressler, 2010). In contrast to the concept, the topic of sustainable development seems to be of such a normative quality that different disciplinary perspectives cannot be arbitrarily juxtaposed. The outlined problems of non-sustainable development demand answers for sustainable development.

Literature

- Adorno, T. W. (1966). *Negative Dialektik*. Frankfurt a.M.: Suhrkamp.
- Albers, B. (2022). Autonomy and Second Nature: A Hegelian Account of Education for Sustainable Development. In H. Kminek, A. Geyer, & M. B. Siewert (Eds.), *Transdisciplinary Impulses towards Socio-Ecological Transformation: Engaged Reflections – Reflected Engagements* (p. 91–114). Opladen: Verlag Barbara Budrich. <https://doi.org/10.2307/j.ctv2b07vnr.8>
- Blühdorn, I. (2020). *Nachhaltige Nicht-Nachhaltigkeit. Warum die ökologische Transformation der Gesellschaft nicht stattfindet* (2., updated edition). Bielefeld: transcript. <https://doi.org/10.14361/9783839454428>
- Carson, R. (1962). *Silent Spring*. Boston: Houghton Mifflin Company.
- De Rivero, O. (2019). *The Myth of Development*. London: Zed Books.
- Dressler, B. (2010). Fachdidaktik und die Lesbarkeit der Welt. Ein Vorschlag für ein bildungstheoretisches Rahmenkonzept der Fachdidaktiken. In B. Dressler & L. Beck (Eds.), *Fachdidaktiken im Dialog. Marburger Schriften zur Lehrerbildung. Vol. 3* (p. 9–23). Marburg: Tectum Wissenschaftsverlag.
- Ehlers, E., & Krafft, T. (2006). *Earth system science in the Anthropocene*. Berlin & Heidelberg: Springer. <https://doi.org/10.1007/b137853>
- Flitner, A., & Giel, K. (Eds.) (1980). *Wilhelm von Humboldt – Werke in fünf Bänden. Band I: Schriften zur Anthropologie und Geschichte*. Darmstadt: Wissenschaftliche Buchgesellschaft.
- Friesen, N. (2021). The necessity of translation in education: Theory and practice. In A. Willmers & S. Jörnitz (Eds.), *International perspectives on school settings, education policy and digital strategies* (p. 337–351). Opladen: Barbara Budrich. <https://doi.org/10.2307/j.ctv1gbrzf4.24>
- Graeber, D., & Wengrow, D. (2021). *The dawn of everything: a new history of humanity*. New York: Farrar, Straus and Giroux.
- Grasso, M. T., & Giugni, M. (2022). *The Routledge handbook of environmental movements*. New York: Routledge international handbooks. <https://doi.org/10.4324/9780367855680>
- Kminek, H. (Ed.) (2023). *Survival Through Education – On the Topicality of Heinz-Joachim Heydorn's Theory of Education*. Opladen: Barbara Budrich.
- Kminek, H., & Wallmeier, Ph. (2020). Problemorientierung als didaktisches Prinzip und politische Notwendigkeit: Zum Umgang mit den Meinungen anderer in der Bildung für Nachhaltige Entwicklung. In J. Eicker et al. (Eds.), *Bildung Macht Zukunft: Lernen für eine sozial-ökologische Transformation*. Schwalbach am Taunus: Wochenschau Verlag.
- Kminek, H., Holfelder, A.-K., & Singer-Brodowski, M. (2022). Zukunft war gestern – Zur Legitimität der Pädagogik in Zeiten der sozial-ökologischen Krise. In C. Bünger, A. Czejkowska, I. Lohmann & G. Steffens, G. (Eds.), *Jahrbuch für Pädagogik 2021. Zukunft – Stand jetzt* (p. 265–276). Weinheim: Beltz Juventa.
- Malm, A. (2016). *The Rise of Steam Power and the Roots of Global Warming*. London & New York: Verso.
- Meadows, D. L. (1972). Die Grenzen des Wachstums: Bericht des Club of Rome zur Lage der Menschheit. In D. L. Meadows (Eds.), *dua informativ*. Stuttgart: Dt. Verl.-Anst.
- Lotz-Sisitka, H., & Lupele, J. (2017). ESD, Learning and Quality Education in Africa: Learning Today for Tomorrow. In H. Lotz-Sisitka, O. Shumba, J. Lupele & D. Wilmot (Eds.), *Schooling for Sustainable Development in Africa. Schooling for Sustainable Development* (p. 3–24). Berlin & Heidelberg: Springer. https://doi.org/10.1007/978-3-319-45989-9_1
- Luhmann, N. (2002). *Das Erziehungssystem der Gesellschaft*. Frankfurt a.M.: Suhrkamp.
- Parrique, T., Briens, F., Kerschner, C., Kraus-Polk, A., Kuokkanen, A., & Spangenberg, J.H. (2019). *Decoupling debunked: Evidence and arguments against growth as a sole strategy for sustainability*. Brussels: European Environmental Bureau.
- Prose, M. (2002). Pädagogisierung und Systembildung. Das Pädagogische im gesellschaftlichen Umgang mit dem Dritte-Welt-Problem. *Zeitschrift für Erziehungswissenschaft*, 5(2), 279–298. <https://doi.org/10.1007/s11618-002-0020-z>
- Rahmsdorf, S. (2022). Klima und Wetter bei 3 Grad mehr. Eine Erde, wie wir sie nicht kennen (wollen). In K. Wiegandt (Eds.), *3 Grad mehr. Ein Blick in die drohende Heiszeit und wie uns die Natur helfen kann, sie zu verhindern* (p. 13–30). München: oekom.
- Rist, G. (2019). *The history of development*. London: Zed Books. <https://doi.org/10.33772/history.v2i2.863>
- Seppelt, T., Klotz, S., Peiter, E., & Volk, M. (2022). Landwirtschaft in einer heißen Welt. In K. Wiegandt (Eds.), *3 Grad mehr. Ein Blick in die drohende Heiszeit und wie uns die Natur helfen kann, sie zu verhindern* (p. 55–78). München: oekom.
- Steffen, W., Richardson, K., Rockström, J., Cornell, S. E., Fetzer, I., Bennett, E. M., & Sörlin, S. (2015). Planetary boundaries: Guiding human development on a changing planet. *Science*, 347(6223), 1259855. <https://doi.org/10.1126/science.1259855>
- The Guardian (2022). *World is on ‘highway to climate hell’, UN chief warns at Cop27 summit*. Access on 27.12.2022. <https://www.theguardian.com/environment/2022/nov/07/cop27-climate-summit-un-secretary-general-antonio-guterres#top>
- Toulmin, S. (1970). Does the Distinction between Normal and Revolutionary Science Hold Water? In I. Lakatos & A. Musgrave (Eds.), *Criticism and the Growth of Knowledge* (p. 39–47). London: Cambridge University Press. <https://doi.org/10.1017/CBO9781139171434.005>
- UN (2023). *THE 17 GOALS | Sustainable Development*. Access on 17.01.2023. <https://sdgs.un.org/goals>
- UNESCO (2017). *Education for Sustainable Development Goals Learning Objectives*. Access on 17.01.2023. <http://unesdoc.unesco.org/images/0024/002474/247444e.pdf>
- Vare, P., & Scott, W. (2007). Learning for a Change: Exploring the Relationship Between Education and Sustainable Development. *Journal of Education for Sustainable Development*, 1(2), 191–198. <https://doi.org/10.1177/097340820700100209>
- Vries, B. de. (2013). *Sustainability science*. Cambridge: Cambridge University Press. <https://doi.org/10.1017/CBO9780511794469>
- Wang-Erlandsson, L., Tobian, A., van der Ent, R. J., Fetzer, I., te Wierik, S., & Porkka, M. et al. (2022). A planetary boundary for green water. *Nature Reviews Earth & Environment*, (3), 380–392. <https://doi.org/10.1038/s43017-022-00287-8>
- WBGU, German Advisory Council on Global Change (2011). *World in Transition. A Social Contract for Sustainability*. Access on 20.01.2023. www.wbgu.de/fileadmin/user_upload/wbgu/publikationen/hauptgutachten/hg2011/pdf/wbgu_jg2011_en.pdf
- Wiegandt, K. (Hrsg.) (2022). *3 Grad mehr. Ein Blick in die drohende Heiszeit und wie uns die Natur helfen kann, sie zu verhindern*. München: oekom.
- World Commission on Environment and Development (1987). *Our Common Future*. Oxford: Oxford University Press.

Dr. Helge Kminek

ist wissenschaftlicher Mitarbeiter am Institut für Allgemeine Erziehungswissenschaft an der Goethe-Universität Frankfurt am Main. Er ist Mitglied des Vorstands der Kommission Bildung für eine nachhaltige Entwicklung innerhalb der Deutschen Gesellschaft für Erziehungswissenschaft.