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About a Metatheory of Education for Sustainable Development as a Cross-cutting Issue of Teacher Education

Helge Kminek

Abstract

The issue of sustainable (non-)sustainability is extremely complex. One widely held thesis is that the transformation towards a desired sustainable society must take place in the ecological, economic and social spheres. Education for Sustainable Development aims to contribute to this transformation. Against this background, it is not surprising that there have been calls to model Education for Sustainable Development as a cross-cutting issue in theory and to establish it accordingly in practice. But what exactly is Education for Sustainable Development as a cross-cutting issue? What (basic) research questions arise in this context? This paper aims to pose and justify (fundamental) research questions such as these and further questions. These questions serve as a first step towards a metatheory of ESD.

1. About the research interest, research questions, ambitions and the scope of the contribution

There is no research without an epistemological interest. This paper is subject to a double, interwoven epistemological interest. It is claimed to contribute to a meta-theory of Education for Sustainable Development (ESD), in this paper with a focus on ESD as a cross-cutting issue. The paper will

initial sketchy considerations that mainly consist of raising questions and concerns. Additionally, the article aims to contribute to the development of ESD theory by means of argumentative and linguistic precision, following a famous statement by Ludwig Wittgenstein.

A meta-theory looks at theories, regardless of the level of abstraction (micro-, meso- and macro-level theories) and scope (area theories – grand theories). One of its achievements is to question unjustified and often not outlined assumptions of theory-building itself. Revealing unjustified and not outlined assumptions leads to the need to justify them and thus to systematically develop educational theory. The framework available here will not allow us to conduct comprehensive studies of the various concrete object-theories in the field of ESD research. Instead, the aim is to raise central questions and to provide possible research perspectives for a systematic progress of knowledge. This can be the achievement of such a meta-theory.

»What can be said at all can be said clearly; and whereof one cannot speak thereof one must be silent.«[1] Wittgenstein probably overshot the mark with this thesis. Given the diversity and complexity of the natural sciences, it is no longer tenable, and even less so for the social sciences and humanities in general, and education in particular. And yet we can still learn something from him and his early work, the *Tractatus*. Namely, to try to argue as clearly as possible as well as to define and use the key terms as precisely as possible. And this seems to me to be particularly true of the issue of ›sustainable non-sustainability‹[2] and ESD, because the complexity of these two issues stands in the way of such a demanded clear argument. This is especially true when one considers the different (background) assumptions in these two areas and the consequences of them of each individual research project.

Against this background, I axiomatically assume that ESD requires a common, tentatively and self-critical meta-theory.[3] As I said, it is the pur-

1 Wittgenstein, Ludwig. Tractatus Logico-Philosophicus. Contributor: Bertrand Russell. Translator: C. K. Ogden. 1922/2021. Project Gutenberg's Tractatus Logico-Philosophicus, https://www.gutenberg.org/files/5740/5740-pdf.pdf [13.06.2024].

2 Blühdorn, Ingolfur et al. Nachhaltige Nicht-Nachhaltigkeit. Warum die ökologische Transformation der Gesellschaft nicht stattfindet. Bielefeld, 2020.

3 Compare: Kminek, Helge. About the need for a common and tentatively formal the-

pose of this paper – respectively the epistemological interest – to contribute to such a theory; mainly by raising questions and concerns.

In line with this research aim and epistemological interest, the central question of the article is: what research questions need to be addressed when ESD is conceptualised as a cross-cutting issue? And with regard to state of the art as a sub-question: what questions can be asked in close connection with the state of the art? The latter question is driven by the interest in gaining knowledge through questioning the (uncovered) assumptions and positions of the state of the art in order to advance research on ESD. However, there are limits to the extent to which this aspect can be systematically investigated within this paper. This article can only present initial heuristic considerations.

There is another limitation of the paper. I do not distinguish between different models of sustainability (for example, one-pillar model, three-pillar model, integrative sustainability model or sustainability triangle). My considerations therefore need to be specified in relation to different models of sustainability.

Generally, to raise questions is the value of this approach, which is limited by the fact that no research contribution to development of its own is presented. The second limitation is that the framework available here only allows for exemplary sketches.

2. Introduction and problem outline

ESD is often identified as a cross-cutting issue and/or with the aim to develop cross-cutting competencies. This is probably not least due to the fact that the term is used in key policy documents on education.[4] Furthermore, if we assume that transformation sustainable development affects and encompasses the economy, ecology and the social and cultural systems

ory of ESD and self-critical reflections. In: *Educational Philosophy and Theory* 55 (13), 2023, pp. 1526–1536, https://doi.org/10.1080/00131857.2023.2200162.

4 Compare for instance: UNESCO. Education for Sustainable Development Goals Learning Objectives. 2017, https://doi.org/10.54675/CGBA9153; UNESCO. Education for Sustainable Development. A roadmap. 2020, https://doi.org/10.54675/YFRE1448.

of society to which ESD relates, then ESD is always a cross-cutting issue given the range of subjects taught at school. This seems to me to be universally true, despite all the theoretical and conceptual differences about what sustainable development would or should look like or about how the transition to such a society can be successful. If we therefore initially assume that ESD is always a cross-cutting issue, then practically every scientific contribution to ESD and teacher education can be interpreted as a contribution to the topic of the cross-cutting issue.

However, it is striking that the issue is scientifically rarely made explicit. If you search in the established database of Scopus within the categories ›article title, abstract, keywords‹ for ›cross-cutting‹ *and* ›sustain*‹ *and* ›teacher AND education‹, you only get 14 hits.[5] If you look through the abstracts of the 14 articles, you will find six articles that can be assigned to the subject area of teacher education and ESD (in the broad sense). They are as follows, in temporally order.

Jutta Nikel's contribution dates back to 2007.[6] The article centres on 10 case studies of student teachers from England, Denmark and Germany. Among other things, their ideas and understanding of cross-cutting policy initiatives on sustainable development and ESD are analysed.

In his contribution from 2019, Tomonori Ichinose[7] looks at the cross-cutting competencies of the cognitive, socio-emotional and behavioural dimensions of learning. The result of his study »in 279 primary and secondary schools in Japan[ ] reveals that in integrated study periods, and

5 Last research: 11.06.2024. Of course, there are numerous contributions on ESD and teacher training (in the broad sense). For an overview see: Fischer, Daniel et al. Teacher Education for Sustainable Development: A Review of an Emerging Research Field. In: *Journal of Teacher Education* 73 (5), 2022, pp. 509–524, https://doi.org/10.1177/00224871221105784. However, the topic of cross-section is apparently rarely addressed centrally.

6 Nikel, Jutta. Making sense of education ›responsibly‹: findings from a study of student teachers' understanding(s) of education, sustainable development and Education for Sustainable Development. In: *Environmental Education Research* 13 (5), 2007, pp. 545–564, https://doi.org/10.1080/13504620701430778.

7 Icihnose, Tomonori. The Effectiveness of the Methods and Approaches of ESD for 2030 Sustainable Development Goals; From Analysis of the Questionnaire Survey to the School Teachers. In: *Journal of Physics: Conference Series* 1417 (1), 2019, art. no. 012072, https://doi.org/10.1088/1742-6596/1417/1/012072.

with the engagement of local human resources, an increase of activities across different classrooms and grades are a clear result of enhanced ESD and students' collaboration, cooperativeness, cooperative attitude, and ability to communicate are interconnected.«[8]

In their article, Adriana Antón-Peset et al.[9] report on an intervention study on food waste in a public primary school in Spain. In the intervention group, they observed a reduction of about 30 per cent in the consumption of fast food at lunchtime. They draw the conclusion from their study that within »the current international framework, and given the seriousness of the climate problem which increases every day, it is necessary to encourage these young citizens' involvement in making progress towards sustainable societies by contributing to SDG from all areas. […] The educational intervention of this study showed that, by working on FW [food waste – H. K.], it contributes to achieve not only SDG 4 and SDG 12, which it is directly related to[,] but, from education, it also allows other Agenda 2030 goals to be worked on.«[10]

Roberto Araya and Pedro Collanqui[11] investigate the feasibility of interactive cross-border science courses with energy experiments with students from Chile and Peru (8th grade) and the development of students' (problem) awareness. According to the authors, the following challenge was ultimately successfully overcome: »There was also the additional challenge of designing a cross-border public class in order to help students develop interpersonal skills and learn to cooperate with peers from other countries, as well as developing cross-cutting concepts related to energy, social development, and the environment.«[12]

8 Ibid., p. 1.

9 Antón-Peset, Adriana/Fernandez-Zamudio, Maria-Angeles/Pina, Tatiana. Promoting Food Waste Reduction at Primary Schools. A Case Study. In: *Sustainability* 13 (2), 2021, 600, https://doi.org/10.3390/su13020600.

10 Ibid., p. 15.

11 Araya, Roberto/Collanqui, Pedro. Are Cross-Border Classes Feasible for Students to Collaborate in the Analysis of Energy Efficiency Strategies for Socioeconomic Development While Keeping CO2 Concentration Controlled? In: *Sustainability* 13 (3), 2021, 1584, https://doi.org/10.3390/su13031584.

12 Ibid., p. 14.

Paula Schönach et al.[13] ask about the integration of sustainability as a cross-cutting issue in the programmes of technical education institutions. They investigate the effects of a new pedagogical course on sustainability at Aalto University, mainly into Engineering Education. The results of their empirical study show that the developed course »seems to be an effective tool to support integration of sustainability into engineering education as a cross-cutting and cross-disciplinary theme.«[14]

And finally, Jordan Correa-González et al. (2023)[15] develop a concept and a set of lessons in a normative way for ESD.

However, explanations of the term »cross-cutting issue« are limited in the contributions, without systematically and critically addressing the concept of ›cross-cutting‹, especially in relation to ESD.[16] So it remains unclear how the cross-cutting nature of the issue is expressed. How it is defined? And what this means in concrete terms for educational practice and ESD research in education? Additionally, there does not (yet) appear to be a scholarly discourse that attempts to bring together the various contributions (implicit as well as explicit contributions to the topic of ›cross-cutting and ESD‹) into a systematic theory or to work on a systematic theory. This is not the aim of this paper, nor would it be feasible given the space available. However, the paper can raise initial questions and concerns for exploring the field.

In the following chapter I will first address what I consider to be the four fundamental questions of ESD. I then turn to the question of the definition of the term ›cross-cutting issue‹. In the fifth chapter I question basic assumptions of ESD, especially in relation to the topic as a cross-cutting issue. The article concludes in the sixth chapter with an outlook.

13 Schönach, Paula/Jaakkola, Noora/Karvinen, Meeri. Impact of Teacher Training on Enhancing Sustainability Integration Into Engineering Education. In: SEFI 2023 – 51st Annual Conference of the European Society for Engineering Education: Engineering Education for Sustainability, Proceedings, 2023, pp. 1169–1179, http://doi.org/10.21427/H8K8-5N19.

14 Ibid., p. 11.

15 Correa-González, Jordan et al. Climate Change and Sustainability in Spanish Classrooms: State of the Art and Didactic Proposal. In: *Social Sciences* 122), 2023, 108, https://doi.org/10.3390/socsci12020108.

16 ›Critically‹ is used here in the sense of ›with scholarly accuracy‹ (according to the Oxford English Dictionary).

3. About the basic questions of ESD in general and the topic as a cross-cutting issue in particular

For the purposes of this article, I will axiomatically assume that every concrete research question and/or argument in the field of ESD – both as a science and as a practice[17] – always relates at least to one of the following four basic questions, be it implicitly. For the cross-cutting topic in focus here, I add to the basic questions in square brackets »as cross-cutting issue«.

- Should ESD be practised pedagogically [as cross-cutting issue]? (normative-prescriptive question)
- If so, how should ESD be practised in education [as cross-cutting issue]? (normative-prescriptive question)
- How is ESD pedagogically practised [as cross-cutting issue]? (descriptive question)
- What are the (side) effects of ESD practice [as cross-cutting issue]? (descriptive question)

The first two questions are normative and prescriptive. Questions three and four are empirical and descriptive. In practice, the answers to the questions will always contain elements of both categories, although the nature of the question (normative-prescriptive and empirical-descriptive) will determine the priority of the answers. In particular, questions A and D as well as B and C are closely related. For example, when answering the question of whether ESD should be an educational practice or not, it is highly relevant what (side) effects such a practice has. And yet the questions do not merge. The reason is that here no ought statements (question one and two) can be derived from factual statements (question three and four). Almost all philosophers since David Hume agree on this.[18]

17 It is well known that the difference between practice and science is that practitioners have to act, whereas scientists do not. In addition, scientists deal with the questions in a different way than practitioners. Thus the dignity of practice lies precisely in the fact that it acts, whereas science in the strict sense does not.

18 It is controversial whether and, if so, to what extent and in which cases factual statements already contain ought statements. If so, ought statements could also be inferred from factual statements. Compare, for instance: Black, Max. The Gap Between ›Is‹ and

However, these questions represent a possible first step towards a metatheory of ESD, which could now be expanded in different directions and dimensions. In view of the specific issue of this present anthology, I will now concentrate on the question of ESD as a cross-cutting issue.

4. About the question of the definition of the term ›cross-cutting issue‹

4.1 About a concrete example regarding the question of the definition of the term ›cross-cutting issue‹

Let us first reflect about a concrete definition proposal: a contribution from the German-language ESD discourse. Magdalena Buddeberg[19] discusses in my view four points regarding ESD as a cross-cutting issue. For the purposes of this paper, I will condense the points, which are the following ones.[20]

1) The interconnectedness of the ecological, economic and socio-cultural aspects to which ESD refers is emphasised. This leads to the conclusion that it is a cross-cutting issue that goes beyond specific school subjects.
2) The term is then negatively defined that, in contrast to environmental education, not only the natural sciences but also the social sciences, humanities, economics and political sciences are required.
3) ESD is extended to include language teaching with a view to intercultural and global learning, and it is concluded that ESD should not be limited to selected subjects but should be seen as a cross-cutting issue or task for schools.
4) Students should not only be taught knowledge but also be equipped with skills to prepare them for future challenges by strengthening

›Should‹. In: *The Philosophical Review* 73 (2), 1964, pp. 165–181, http://doi.org/10.2307/2183334.

19 Buddeberg, Magdalena: Bildung für nachhaltige Entwicklung als Querschnittsaufgabe. In: *Die Deutsche Schule* 108 (3), 2016, pp. 267–277, https://doi.org/10.25656/01:25962.

20 Compare ibid., pp. 269–270.

> their capacity for agency. This is followed by an explanation of the definition of competence, which I will leave out here because for my specific interest in knowledge it is not relevant.

In summary, Buddeberg concludes: »The implementation and embedding of ESD holistically throughout school life is therefore a cross-cutting task at the content, conceptual and didactic levels«[21].

In the further course of Buddeberg's article, the extent to which ESD has found its way into educational administrative guidelines and measures in Germany as a cross-cutting task is examined. In the next step the (then) state of research on the implementation of ESD in schools is addressed.[22] And finally, the article concludes with an outlook on the further need for the implementation of ESD in schools and the associated research desiderata.

The structure of Buddeberg's paper already shows that definition is not innocent, because the definition determines what becomes the empirical object of research and how. An alternative definition might not only have taken a different perspective on the empirical reality of administrative policies and measures but might also have drawn different conclusions and identified different research desiderata. Whether or not this would have been the case is irrelevant to the epistemological interest pursued here. I will now turn to a reflection and analysis of the definition.

The definition is characterised by positive determinations and negative limitations. Hence, the term is fundamentally defined, particularly by the negative limitation in relation to environmental education. This means that the definition is not an open definition. With an open definition, the term would be infinitely full or empty because it would be unclear where the term ends or what does not belong to the term, respectively. In addition, the interconnectedness of the named aspects is emphasised and, in relation to school and the usual school subjects, extended to include lan-

21 Ibid., p. 270 – translated by H. K.

22 For a more up-to-date assessment, see for example: Singer-Brodowski, Mandy/Kminek, Helge. Zu den Zielen von Bildung für nachhaltige Entwicklung und dem Stand der Implementierung im deutschen Schulsystem. In: *Die Deutsche Schule* 115 (2), 2023, pp. 94–104, https://doi.org/10.31244/dds.2023.02.03.

guages and, now in relation to educational theory, competences in addition to knowledge. What is relatively unclear, it seems to me, is the definition of what exactly »interconnection« means. This question is not unique to this case, so I will now move the discussion to an abstract, general level.

4.2 General considerations regarding the question of the definition of the term ›cross-cutting issue‹

What exactly is a cross-cutting issue in relation to ESD (in schools)? As trivial as it may seem at first glance, it is not. The fact that the definition of cross-cutting issue is not trivial is due to the fact that the term ›cross-cutting‹ already has different meanings. There are at least three possible meanings.

Firstly, as for example in mathematics, cross-section can refer to certain properties that come together. According to this understanding, ESD would probably be conceived or understood as interdisciplinary. The relevant research would then possibly argue in favour of addressing bioethical issues in ethics and/or biology classes (basic questions A + B, see above). Or it would be empirically investigated for a corresponding pedagogical practice (basic questions C + D, see above). With regard to this variant, the question can be asked whether any form of interdisciplinary teaching is an ESD pedagogical practice. This is certainly not necessarily the case for sport management. In other words, further provisions would be needed to define teaching as a cross-cutting ESD issue. To this end, it would also be necessary to identify which forms and contents of interdisciplinary teaching are not ESD.[23] And that would bring us to the content-related debates on what is actually meant by sustainability or sustainable development.

Secondly, there is the possibility that an object is cross-cutting. In this case, the school as an object would be cross-cut and opened, like a cross-sec-

23 The question of both positive content and negative exclusion must always be answered. Otherwise, the definition is always at least ambiguous, if not arbitrary.

tion of a cut tree[24]. In this way different aspects of ESD would be visible everywhere – education in general and teaching in particular as well as the management of the school and so on. Everything together would make up ESD, just as the different aspects of a tree, which become visible through the cross-section, make up the tree as a whole. This understanding suggests a whole institution approach.[25] This option differs from the first variant in that there has not to be interdisciplinary teaching. This variant of understanding ›cross-cutting issue‹ can also be related to all four basic questions mentioned above. At least one open question in this case is: How – metaphorically speaking – the school should be cross-sectioned so that all relevant aspects come to light? And the counter-question would also need to be addressed for an appropriate definition: What form of cross-cutting is inappropriate and why? These questions evoke the exact determination of the cross-cutting section.

And, *thirdly*, ESD as a cross-cutting issue can also be understood as a combination of the first and second variants. In this case, at least all the questions necessary to define the first and second variants would have to be answered.

Raising the issue of definition of central terms – here in our case ›cross-cutting issue‹ – is not to say that it is possible to say definitively how the term should be defined, nor that a specific proposed definition cannot be debated academically.[26] However, in line with the initial thesis of this article, the greatest possible attention should be paid to addressing the question of

24 This example is only meant to illustrate the idea. The example is limited by the fact that a cross section of a tree immediately raises the question of whether all relevant aspects are visible in the cross section. This question also arises in relation to ESD as a cross-cutting issue.

25 Compare, for instance: Holst, Jorrit. Towards coherence on sustainability in education: a systematic review of Whole Institution Approaches. In: *Sustainability Science* 18, 2023, 1015–1030, https://doi.org/10.1007/s11625-022-01226-8.

26 At this point I follow Theodor W. Adorno and his concept of the »non-identical«, i. e. the position that concept and thing are never identical, i. e. congruent; see: Adorno, Theodor W. Negative Dialectics. London, 1990/1966. Nevertheless, Adorno also never advocated the position of conceptual arbitrariness; see, for example, Adorno, Theodor W. Philosophische Terminologie, Bd. 1. Frankfurt, 1973.

definition of the important terms. If the question is not addressed and a definition is avoided, then the necessary condition for scientific discourse and scientific-systematic progress of knowledge is not met.

The same applies to the background assumptions of any scientific theory, model or concept. This is true even if one cannot constantly deal with these background assumptions. After all, if one were constantly to deal with the background assumptions, empirical research in particular would not be possible. This does not mean, however, that the necessary reflection and justification of background assumptions can be ignored.[27]

In the following section, I will focus on the reflection of a common background assumption regarding ESD.

5. About a fundamental assumption of ESD as a cross-cutting issue

ESD aims to contribute to the desired transformation of societies towards sustainable societies. Embedding ESD as a cross-cutting issue in schools and teaching seems to be the right approach for many researchers. Even without empirical research on the subject, it is probably safe to say that the majority of ESD researchers feel this way. This is likely to be the case even if there are differences of opinion on fundamental issues, such as the understanding of sustainability, sustainable society and cross-cutting issues. For a self-critical ESD metatheory, it makes sense to question this assumption, especially for the reason that this critical questioning can stimulate further research and thus contribute to the development of theory.

Firstly, statements such as the following can be questioned: »But despite these efforts to mainstream ESD, international monitoring shows that the goal of a broad implementation into all educational levels is not yet achieved.«[28] For example, it should be considered whether this conclusion on the status of ESD implementation is too unambiguous and too generalised. It would be necessary to reflect on what concept of implementation is to be applied and what follows from such a use of the term.

27 For science, this can certainly mean working together in a division of labour.

28 Fischer et al., Teacher Education, p. 510.

If implementation simply means that the term ESD appears in educational policy documents, decrees, regulations, etc., then the conclusions can easily be labelled as ›true‹. However, if implementation also means that a certain educational practice has been implemented with corresponding teaching content and formats, then caution should be exercised in drawing conclusions. First of all, it would be necessary to ask empirically whether and, if so, to what extent ESD-equivalent forms of educational practice already existed in the past, and this has to be asked before the term ESD was coined. However, this practice of the past was not labelled as ESD. Given that the data situation is probably too thin for such an empirical study, this would probably be a question that could hardly be answered. This makes it all more necessary to be clearer and more cautious about the scope of statements.

Secondly, the central question for ESD can be posed as to whether education can fundamentally transform societies. There seems to me to be no doubt that education can fundamentally transform an individual. But does this also apply to whole societies? It seems to me that the development of ESD theory could benefit from a more critical approach to this question, especially since theorising would not be starting from scratch.

Siegfried Bernfeld, for example, was a pedagogue and educational researcher who also wanted to fundamentally change society through education and, after his own practical experiments, declared education to be fundamentally conservative. His work »Sisyphus and the Limits of Education« (»Sisyphos und die Grenzen der Erziehung«[29]), which will be discussed in more detail elsewhere, is a critical instance of objection. He reminds us of the difference between the hopes placed in education on the one side and the actual processes and results on the other side. Is his position correct? His position is at least supported by the fact that there have probably been countless attempts to improve society through education. Hence, there is probably no lack of motivation on the side of the educators.

29 Bernfeld, Siegfried. Sisyphos oder die Grenzen der Erziehung. Frankfurt a. M., 2006/1925. Bernfeld sees the three limits in (i) the material and ideological structures of the existing capitalist society, (ii) the mental state of the educators and (iii) the inherent dynamics of human ontogenesis.

Whether education has been able to fundamentally change society is not least a question of historiography. So it may be worth working with historians on this question. Again, this is not a topic that can be dealt with comprehensively here. Instead, I would like to give an example of the content of an interdisciplinary research project that would investigate the question of the overall social effectiveness of education.

According to the historian Ian Mortimer and his argument, fundamental transformation or at least far-reaching social changes through schools and teaching are possible. He argues as follows.

The Catholic Church set up schools so that more people could read the Bible for themselves. »Schools were almost unknown in 1000 but waves of educational reform completely changed that situation. The Third Lateran Council of 1179 decreed that every cathedral should operate a school. The Fourth Lateran Council of 1215 added that every church with sufficient wherewithal should do likewise. Many schools were established over the course of the thirteenth century but even more were set up over the next two centuries, so that every town had one by 1600. In addition, universities came into being. Oxford was established in the twelfth century; Cambridge in 1209. There were seventeen other universities across Europe by 1300 and dozens more by 1500. […] Most of all, the universities taught students to think and to argue, thereby giving them the tools to make original contributions of their own.«[30]

All this led to a reduction in illiteracy. And at the same time, according to Mortimer, this development led to more people looking critically at the Bible and the structures and practices of the Catholic Church. In the long run, this led to a loss of power for the Catholic Church in general and prepared the ground for the Reformation and the division of the Christian faith community in particular. As is well known, the Reformation and the division of the Christian faith community led to diverse and fundamental social changes.

This could already answer the question of the possibility of fundamentally changing society through education. However, the situation is not so clear-cut. In contrast to the aims of ESD, the impact of schools and teach-

30 Mortimer, Ian. Medieval Horizons. Why the Middle Ages Matter. London, 2023, pp. 34–35.

ing in the case of Christianity was not only at odds with the intentions of the Catholic Church. The process also took place over several centuries. The desired and necessary transformation towards sustainable societies does not have such a time frame.

Against this background, historical research on the possibilities and limits of education in transforming societies should be expanded. There should also be more empirical research on the impact of ESD in society. This is not a new question, to take just one example: »a clearer link between learning processes and design elements with the respective learning outcomes will help to better understand the effectiveness of different [ESD – H. K.] approaches«.[31]

However, it seems to me that empirical research on the effects of ESD must necessarily be extended to include the long-term perspective, so the historical dimension. As much as this is not empirically possible in terms of direct (causal) effects, this perspective should not, in my view, be ignored. Otherwise, scientific ESD research will have to face the question of whether its research contributes to ideological formation and thus to the perpetuation of ›sustainable non-sustainability‹.

A third critical question that ESD has to face in general and in relation to its specificity as a cross-cutting issue in schools is the following: Is the claim that ESD can transform society still appropriate and suitable in the light of current socio-ecological conditions?

Following Ana Honnaker's considerations, we can ask whether the currently appropriate educational task might not be to recognise that humanity has failed and is failing.[32] And an ESD that still believes in successfully dealing with the (poly)crisis is not only structurally in the way of this educational task that has been recognised as appropriate. Such an ESD works against this appropriate educational task. Such a perspective breaks with the unshakeable belief in progress, which »can be regarded as one of

31 Fischer et al., Teacher Education, p. 515.

32 Honnacker, Ana. »No hope for mankind!« Scheitern als Aufgabe des Menschen im Anthropozän. Kann das Anthropozän gelingen? In: Olivia Mitscherlich-Schönherr, Mara-Daria Cojocaru, Michael Reder (eds.). Krisen und Transformationen der menschlichen Naturverhältnisse im interdisziplinären Dialog. Berlin, Boston, 2024, pp. 221–240, https://doi.org/10.1515/9783111091396-011. This is not an argument for relaxing mitigation and adaptation to changed conditions. See also: ibid, pp. 234–235.

the metaphysical foundations of the non-sustainable way of life«[33] and is often inscribed in ESD. In the light of the current crisis, which is increasingly being described as a poly-crisis in various dimensions such as ecological[34], economic[35] and socio-cultural[36] aspects, Honnacker's thoughts are becoming more and more plausible.

6. Outlook

In connection with the topic of ESD as a cross-cutting issue it is often stated as a normative demand that the division into school subjects should be overcome. This is many times put forward with the reformist pedagogical desire to do away with what is conceived as outdated in terms of time and content – i. e. to do away, at least in part, with the division of school subjects. The following questions are not intended to argue against this demand in principle. Nevertheless, it seems appropriate to clarify the ques-

33 Ibid., p. 229.

34 Compare, for example: IPBES. Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the intergovernmental science-policy platform on biodiversity and ecosystem services. Bonn, 2019, https://zenodo.org/records/3553579 [15.10.2024]; IPCC. Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge, 2021 https://doi.org/10.1017/9781009157896.001; Richardson, Katherine et al. Earth beyond six of nine planetary boundaries. In: *Science Advances* 9 (37), 2023, eadh2458, https https://doi.org/10.1126/sciadv.adh2458; Runhaar, Hens et al. Mainstreaming biodiversity targets into sectoral policies and plans: A review from a Biodiversity Policy Integration perspective. In: *Earth System Governance* 20, 2024, 100209, https://doi.org/10.1016/j.esg.2024.100209; Sylvester, Francisco et al. Better integration of chemical pollution research will further our understanding of biodiversity loss. In: *Nature Ecology & Evolution* 7 (10), 2023, 1552–1555, https://doi.org/10.1038/s41559-023-02117-6.

35 Compare, for example, Piketty, Thomas. Capital in the Twenty-first Century. Cambridge/MA, London, 2014. And: Freeman, Alan. The Geopolitical Economy of International Inequality. In: *Development and Change* 55, 2024, pp. 3–37, https://doi.org/10.1111/dech.12812.

36 Compare, for example, for the case of Germany: Zick, Andreas/Küpper, Beate/Mokros, Nico. Die distanzierte Mitte. Rechtsextreme und demokratiegefährdende Einstellungen in Deutschland 2022/23. Bonn, 2023.

tions that arise in this context. For here again, it is precisely by invoking and examining answers to questions that scientific theorising and scientific knowledge can be systematically advanced.

In terms of educational theory, the question should be asked as to what exactly distinguishes a cross-curricular theme from other models – in particular interdisciplinary teaching. With such a trained eye, empirical research could also be carried out – if the data situation allows it – to see whether and, if so, to what extent there have already been pedagogical teaching practices in the past that can be understood as cross-cutting even though these practices were not labelled as cross-cutting. Just because a new concept is created does not mean that it has not already been practised. Such research addresses the basic questions B and C (see above).

But even if teaching in a cross-cutting way would be a distinct new one, still two comparative and interwoven questions have to be asked, one relating to educational theory and the other to empirical research.

In terms of history and educational theory, we could ask how the fact that the planet is not divided into school subjects was dealt with in the past. In life every (human) being is always confronted with the whole planet, not with school subjects, and so in a specify cross-cutting way. How has this fact been dealt with in educational theory? What forms of dealing with this totality have been empirically produced in and by traditional subject teaching? – A re-reading of the pedagogical classics might be instructive. Such a re-reading can not only enrich the normative state of research, especially with regard to basic question B (see above). It can also sharpen and develop our view of empirical research (questions C and D, above).[37]

Finally, there are the normative and empirical questions of what a teacher training programme that educates, trains and develops teachers in ESD as a cross-cutting issue looks like or should look like? The question

37 In this context, the normative modelling and argumentation of Bernhard Dressler should certainly have been considered. Unfortunately, such a discussion cannot take place within the present paper. On Bernhard Dressler's modelling, see pages 28–29 in this volume and: Dressler, Bernhard. Fachdidaktik und die Lesbarkeit der Welt.: Ein Vorschlag für ein bildungstheoretisches Rahmenkonzept der Fachdidaktiken. In: Katharina Müller-Roselius, Uwe Hericks (eds.). Bildung – Empirischer Zugang und theoretischer Widerstreit. Opladen, Berlin, Toronto, 2013, pp. 183–202, https://doi.org/10.2307/j.ctvdf067c.13.

of what kind of professionalism teachers should be educating and training will need to be addressed.[38]

However, if ESD as a science also wants to contribute to socio-ecological transformation, all these questions only make sense under the following condition: that ESD as a cross-cutting issue (in schools) does not itself represent as a framing of non-sustainable structures and cultures. This could be the case because the framing of ESD as a cross-cutting issue also fundamentally presupposes the separation of subjects, even if this division is to be overcome. Whether a completely new way of thinking is required, what this might look like and what contribution ESD can make to it is an extremely challenging question that can probably only be answered in cooperation with other disciplines. However, it seems to me that this question should also be addressed in order to ensure that ESD as a cross-cutting issue does not contribute in a way that runs counter to its own normative intentions.

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38 The interdisciplinary orientation of the programme and the pedagogical justification of this orientation are nothing new. Peter Euler, for example, argued for and demanded this in his postdoctoral thesis in 1999 – for all degree programmes, especially those in the natural sciences and engineering: Euler, Peter. Technologie und Urteilskraft. Zur Neufassung des Bildungsbegriffs (Schriften zur Bildungs- und Erziehungsphilosophie, Bd. 15). Weinheim, 1999. Compare: Kminek, Helge. Zum Beitrag der kritischen Bildungstheorie Peter Eulers im Anthropozän. In: *Soziale Passagen* 16, 2024, pp. 199–214, https://doi.org/10.1007/s12592-024-00506-7.

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