DOI: 10.2478/dcse-2022-0007

sciendo

Discourse and Communication for Sustainable Education,
vol. 13, no. 1, pp. 77–87, 2022

Teaching Sustainability: A Study of Teachers and Conceptual Tensions

Anne-Katrin Holfelder
Institute for Advanced Sustainability Studies, Potsdam, Germany

Abstract

Teaching sustainability topics puts teachers in a tense relationship: on one hand, they should convey the importance and urgency of the topic, but at the same time, this should be done in such a way that students can form their own judgements. In addition, teachers may themselves become privately involved and interested in the topic, which requires a professional understanding of their role. This concern was pursued in the present study. Teachers who teach sustainability topics were interviewed in semi-structured interviews. This article presents the results by means of case studies that show three contrasting cases. There are two ways of avoiding the tensions and one that takes the tension as an inherent part of the topic.

Key words: education for sustainable development, teacher professionalization, student evaluation

Background and Research Interest

Sustainability should be understood as a search and negotiation within society rather than a tangible goal. The same applies to sustainability education. In academic discourses, maintaining the complexity of sustainability issues and different perspectives is stressed for educational and democratic reasons. Criticism is voiced when teachers simplify sustainability issues and give clear answers (Jickling & Wals, 2008; Öhman & Öhman, 2012). Integrating different perspectives and values is considered necessary (Sandell, Öhman, & Östman, 2005). This position is related to teaching methods that make various perspectives evident and allow students to discuss and reflect on them.

The three teaching traditions developed for environmental education (Sund, 2015) can also be applied to teaching in the context of sustainability. On the basis of empirical material, the teaching traditions illustrate on one hand the different object perceptions, for example the understanding of sustainability, and on the other hand the associated notions of teaching and the role of education. The *fact-based* tradition approaches environmental problems as ecological issues that can be solved with scientific knowledge. The *normative* tradition, on the other hand, conceives of problems rather as a question of values. The goal of education within this tradition is therefore to make values and lifestyles evident and to discuss better ways of living. The last – often favored – position

is the *pluralist* tradition. Uncertainty is here an integral part, and with it the question of what sustainability actually means. Accordingly, sustainability problems are seen as conflicts between human interests. Thus, they represent moral and political problems. Education should enable people to recognize these conflicts and to have a say in discussing causes and possible solutions.

Empirical studies show that these aspects represent a particular challenge for teachers. More than half of teachers do not feel well prepared with regard to sustainability issues or for teaching controversial topics (Borg, Gericke, Höglund, & Bergman, 2012). The presented issues are further influenced by different traditions in school subjects: social science and geography teachers feel better prepared, have fewer problems with pluralist positions and use more ESD-compliant methods (Borg et al., 2012; Summers, Childs, & Corney, 2005; Corney, 2006). Borg et al.'s (2012) study shows that there is a link between subjects and methods used: science teachers are more likely to draw on the fact-based tradition and often choose lectures as their method. Social science teachers tend to align more with the pluralist tradition and often favor group discussions. In addition, the connection between conceptualizing sustainability and the method of teaching is stressed in the above studies. Corney (2006) shows how student-teachers of geography also find it hard to define their own role within the tension between biasing students and taking the urgency of global problems seriously.

This tension has led other studies to investigate whether the teachers' pedagogic orientations are connected to their beliefs. Sund (2015) asserts that (in terms of individual actions) morally convinced teachers favor their own positions and present the topics in a less differentiated manner. In contrast, teachers holding a more pluralist and political understanding of sustainability present topics in a more complex and nuanced way. Andersson (2016) supports this result: student-teachers who consider teaching ESD as a moral obligation are less concerned with convincing their students about the validity of individual actions. A study from Kater-Wettstädt (2017) shows that those pedagogic orientations influence the students' levels of comprehension of a topic. She describes how students engage with sustainability issues on the basis of their teachers' pedagogic orientation. Addressing students as moral subjects and the associated (implicitly) built-up need for individual action hinders a deeper (personal) engagement with the topic. Students apply different strategies in dealing with this built-up need (for instance, reproducing a teacher's opinion, or discussing the issue on an abstract level). All have in common that they are detached from the personal level. In contrast, more open didactic approaches allow for deeper engagement on the part of students.

The above-mentioned studies show that aspects of pedagogic orientation (like multi-perspectivity), a teacher's personal convictions and teachers' and students' notions of sustainability play an important role in teaching sustainability topics. The position favored in academic discourses (viewing sustainability problems from different perspectives) confronts teachers with a challenge in two respects. First, not all teachers are familiar with the methods and teaching approaches favored in the ESD context (see above). Second, even with the focus on a multi-perspective approach, teachers still occupy a field of tension: they have to communicate the necessity of the topic, but at the same time they should not overwhelm the students or demand that they take specific actions. The present study aims to gain more insights into these aspects with respect to the way this tension is variously handled. The main focus is on examining the role played by the notion of sustainability, and the teachers' relationship to it as well as the understanding

of the role of education. This tension should be seen as a category given by the researcher and not as something that the teachers themselves perceive as such.

For the purpose of this study, teachers who voluntarily offer sustainability courses in Germany were interviewed in semi-structured interviews. To gain insights into the background of these courses and thus the context in which teachers operate, the following briefly outlines the situation regarding sustainability education in Germany. In general, teachers in Germany are encouraged to integrate sustainability topics into their lessons. Nationwide committees, such as the Standing Conference of the Ministries of Education and Cultural Affairs (KMK) and the Federal Ministry for Economic Cooperation and Development (BMBF), recommend that school lessons should be oriented towards sustainability principles (KMK & BMBF, 2016). In the federal states, the principles of sustainability have arrived at least at the level of the school curricula of certain subjects. A comprehensive and interdisciplinary introduction has not yet been achieved (cf. Singer-Brodowski, Brock, Etzkorn, & Otte, 2019). The same applies to teacher training at different stages. Ultimately, it can therefore be assumed that teachers in Germany have very different backgrounds in terms of knowledge and ideas about sustainability and of how best to teach it. Due to a lack of comprehensive teacher training that focuses on this theme, it must also be assumed that sustainability education is also (or mainly) given by teachers who have been in contact with the topic outside educational institutions.

Research Interest and Methodical Approach

One aim of this qualitative study is to gain a deeper understanding of how teachers handle the tension between the need to teach sustainability issues on the one hand and the risk of overwhelming students on the other. The second aim is to attain an initial grasp of how teachers deal with different student statements and to relate this to the question of how teachers deal with the tension. This contribution represents an exploratory study, aiming at an overview of the different ways of dealing with tension. I therefore tried to interview teachers who had differing approaches to the topic. The teachers varied in their backgrounds regarding their subjects, form of school and years of experience. Still, all the teachers either teach a natural science subject or geography.

The interviewees are teachers who consider themselves 'sustainability teachers'. The teachers either teach a sustainability course or it is important to them that sustainability topics are included in lessons. The latter group represents the majority of those interviewed and responded mainly to calls for the study in ESD networks or schools. The former group was mostly addressed directly. Teachers were sought in two different ways: firstly, in a teacher network in which committed teachers exchange information, and secondly, by approaching schools directly. In general, it was difficult to find teachers, so the response rate was very low. Therefore, all teachers who came forward were interviewed; there was no selection. Four of the teachers interviewed were already known to the interviewer from other sustainability projects. The interviews took place at different locations, with teachers either coming to the interviewer at the institute or the interviewer visiting teachers after school hours. Two interviews took place digitally due to Covid-19 restrictions.

The methodological background of this study is based on the sociological assumption that practice is organized by implicit forms of knowledge (Mannheim, 1982). For reasons of space, this theory can only be briefly discussed here. Implicit knowledge is an experi-

ence-based knowledge and represents a contrast to other forms of knowledge. For example, knowledge about certain facts can be passed on to others. Implicit knowledge, on the other hand, arises from experiences that an individual makes in his or her life.

How certain situations are interpreted also plays a role here. It ultimately gives the actors orientation in daily life, also with regard to possible new topics or situations. Agents are not always conscious of this implicit knowledge when they act, but in principle this form of knowledge can become conscious to agents. Implicit knowledge should by no means be understood as a purely individual construct. How we perceive and interpret experiences always depends on our environment (cf. Bohnsack, Pfaff, & Weller, 2010). With regard to empirical work and the question of how such a form of knowledge can be collected and reconstructed, passages in which the interviewees become absorbed in their narratives or describe situations are of particular interest. Less suitable are interview forms that aim at particular constituents, abstractions or categories of knowledge. It is important that the interviewee is able to decide his or her own focus as far as possible. Therefore, at least at the beginning of the interview, open questions should be asked that encourage someone to relate or describe. The questions should also not include any pre-interpretation or evaluation by the researcher.

The interviews were divided into two parts. 1) In the first part, teachers were asked to explain how they came to the topic of sustainability in general and specifically to sustainability in the school or educational context. They were then asked to describe their lesson preparation and teaching. They were also asked to describe a particularly important moment in their lessons or in their everyday school life (either "successful" or frustrating or both). This first part serves to reconstruct their orientations towards the cited factors. 2) In the second part of the interview, the teachers are confronted with teaching material (a short video sequence) which is highly moralizing and invites students to consume in a different way (typical for the "normative tradition", Sund, 2015). This video sequence first describes the journey of a clothing item and then the working conditions of seamstresses. Both themes are presented in a highly reduced form. Afterwards the question "What can you do?" is asked and possibilities (second-hand clothing, fair-trade ethics, and ecological clothing) are presented. Showing respondents this video sequence aimed to arrive at insights into their understanding of education with regard to sustainability.

After this sequence, they were given three different transcripts in which students react to the presented video sequence. These sequences represent three types of student response to a moral call that were reconstructed in another research project of the author's (Holfelder, 2020; see appendix). The teachers were asked to give their initial thoughts about the reaction and also to reflect on the transcript according to goals in ESE. This second part primarily supports the analysis of the cited factors (as the evaluation is an immediate reaction within the interview and not a re-narration of the respondents' own practice).

Again for reasons of space, the analysis stage can only be described briefly (for details see Bohnsack et al., 2010; for other examples, cf. Gresch & Martens, 2018, Wettstädt, 2017, Applis, 2015). The first step is to choose the passages that are of interest to the research question. These are mainly passages in which the interviewees comment on aspects of the research question. Ideally, they talk freely and use metaphors. The selected passages are interpreted sequentially. The transcript is interpreted by way of the following criteria: 1) What is the respondent's basic understanding of the phenomenon

(i.e. sustainability and sustainability education)? 2) What underlying orientation allows such a statement? 3) Can the first interpretations be confirmed in statements appearing later in the passage and in other passages? As the last question shows, it is not a matter merely of focusing on individual statements, but rather of reconstructing a fundamental orientation that is also evident in other passages or themes. In a second step, passages from one interview are compared with those from another, in order to confirm, revise or support previous findings. This step is also important for the formation of types with regard to the research question. A further quality feature is the interpretation of our own results with other researchers. So far, 12 interviews have been conducted and evaluated.

Research Findings

The results of the interviews will be presented below using three contrasting cases. This type of presentation is most illustrative of the different ways in which the teachers interviewed have dealt with the subject of research. It should also be noted that these contrasting cases are considered to be typical for one type of approach to the topic of teaching sustainability, although more mixed approaches are also evident. All names are changed for privacy reasons.

Marlies – Sustainability Education as a Mission

Marlies is a secondary school teacher from a large German city who has been teaching for over 25 years. The question of whether she can tell us how she came into contact with the sustainability issue is answered with a reference to her own school experience. She came into contact with the topic of global justice at that time and has been interested in it ever since. She is involved in teacher networks, and this is also how the contact came about. In her further comments on sustainability and her engagement with it, she uses vocabulary that describes sustainability as a conviction of individual people forming a movement. She often uses terms like "getting on board", "reaching more people", "community that grows". Without being directly asked to do so, she describes right at the beginning of the interview what her goal is in terms of education:

> *And, yes, some of them actually decide to go in that direction when they study. Well, I've already had several students who, for example, started studying in* [she names a medium-sized city with a sustainability-focused university] *at this university – is it, I think, exactly – which is always a confirmation, where I think: Yes* [enthusiastic]*! We've made it! Or just after I taught this sustainable nutrition here, a lot of pupils come to me in the next school year and say then, after the summer holidays, Mrs. Majer, Mrs. Majer, I absolutely have to tell you something, I'm on a vegetarian diet now* [imitates an excited voice]*; or something like that, yes, something like that... You can really tell that it reaches the pupils and what comes back, so to speak...*

Marlies explicitly quotes intra- and intergenerational justice in relation to sustainability. Implicitly, her descriptions are based on the fundamental question of what can and should be done individually to change the situation. This becomes especially explicit when she describes school education (as also in the above quote). Here, she is oriented towards the question of what information the pupils need to adequately understand the

problem on the one hand, and to make it clear that there is a need for action on the other. This orientation is made explicit in the evaluation of the students' statements. In this excerpt (see appendix, group A) the students explain that one person alone cannot make a difference and that it only makes sense if everyone does it.

> *Yeah. That's part of the way I imagine it works for us, too, with the older ones here.* [...] *And then I would intervene right away with such pictures as this Raza Plaza there in Bangladesh or Plaza Raza, I don't know, collapsed there and would show them that it's important that we agree on this and that we really come to the conclusion: you can't just be so disbelieving* [...] *you can't just be neutral in this respect; and I would like to achieve that, that they don't remain so neutral and say: it's just about my appearance, or something.*

For Marlies, the concept of sustainability is not characterized by tensions or inconsistencies. The same applies to sustainability-oriented teaching or school projects. This does not mean, though, that she generally excludes tension or multi-perspectivity. For example, in the reaction to group B of pupils it becomes clear that she agrees with their diagnosis on a political and systemic level and at the same time expresses resignation that they can hardly deal with this as individuals. The analysis shows that Marlies rather orients herself towards questions and topics that are clearly decisive (for example, waste separation or nutrition). In her descriptions of lessons and projects, she always reports that the topics are directly related to the students' actions. Furthermore, she bases herself on a school-oriented understanding of education in which facts and values play a central role. The moral evaluation is independent of the teacher, as it is inherent to the problem.

Paul – ESD as a Change in Didactics

Paul is a young teacher who has been teaching for a few years. He responded to my request to his school. His first contact with the subject was during his university education. He explicitly describes the concept of ESD as something normative. However, unlike Marlies, normativity cannot be categorized into right or wrong beliefs or right or wrong actions, but rather is based on the representation of facts through different perspectives. It is on the one hand this multi-perspectivity and on the other the preservation of complexity that is normatively desired. He describes ESD as a concept that structures his teaching, which primarily determines his didactic orientation. Thus he states that role-playing or scenarios are often used. These can also be reconstructed in his descriptions of teaching and short narrative sequences.

> *And, when I realize that this process at least begins, that you start to think about it, not ashamed, that you think, oh God, we are not allowed to do anything anymore. But simply that they become aware of it. Then a lot has already been achieved and when, when the children start, which is often after the third or fourth theme, it will start at some point, that they really start with these models, with this concept of these different perspectives, when they then start to link them* [...] *these, uh, are actually the moments that I find successful.*

For Paul, successful moments are when students show multi-perspective and systems thinking. In the further descriptions and short narrative sequences, Paul is guided by his

pedagogic and methodological orientation. For example, he says that a firmer establishment of sustainability in teaching has met with the displeasure of "older colleagues" in his area of expertise. He justifies their dislike by saying that they already have their lessons "in the drawer" and shy away from the additional effort. As a challenge to ESD, he also mentions the additional work involved. It becomes clear that for him, ESD means primarily a pedagogic and methodological change, in other words a teaching reform. This does not mean that he does not address the content aspects of ESD. These are only in the background and – unlike with Marlies – are not expressed in the categories 'right' or 'wrong'. This pedagogic orientation is also expressed in the commentary on the video sequence, which is critiqued for its language (as including too many technical terms, for example).

Up to the section on student statements, Paul's understanding of sustainability remains unclear, as the pedagogic orientation is at the forefront of his descriptions. In the evaluation of the student statements (group C), his relationship to the topic of sustainability becomes clearer:

> [...] *uh, and apart from that, no, if you don't have anything – This is – I think this is one of the very exciting contributions, you can't really complain in such discussions if you don't behave completely ecologically yourself, and this is probably what is meant here. Um, well, we can't complain, um* [...] *I think I would motivate the children to do it anyway. I mean, sure, I also find it very paradoxical that the people who think about it the loudest – those who are, those who are, are the ones who usually make three, four, five air trips a year and that has the best ecological footprint in principle, uh, the, uh, social welfare-pensioner who has the TV on all the time, but is actually in the same place all the time. Um, I did see one of those statistics or something. I found it totally paradoxical.*

He later clarifies his opinion that one "can nevertheless deal with the issues even if you're not 100 % on all fronts." The material as a whole expresses a certain distance to the sustainability discourse. After the interview, Paul adds that he was initially very sceptical about the issue in the education sector because he often associates this with a raised finger. During his studies, the subject matter became increasingly appealing to him, as it became clear to him that important skills were being encouraged.

William – Sustainability and Education as a Field of Tension

William is a teacher who studied social sciences and geography, with over 20 years' teaching experience. He mentions that the Rio Climate Conference in 1992 was a catalyst for him to take a deeper look at the topic both privately and at school level. Already at this point a clear disappointment with political decisions becomes apparent: "It did not turn out to be quite as true as I had imagined at the time". In his comments, he is clearly familiar with different definitions of sustainability and is in favor of a strong sustainability approach. Already in the definition of sustainability, as well as in his remarks on his first school project, it becomes clear that he is strongly oriented towards scientific approaches. In contrast to Marlies, he focuses on the contradictions and challenges in the concept. He mentions that he perceives a tension in the concept of sustainability between ecological and social justice. It is difficult for him to demand the same contribution to climate

protection from the "poorest countries" compared to richer nations, but at the same time climate protection is an urgent concern. However, he sees a clear responsibility on the part of the developed nations. At another point, he emphasizes that sustainability "must come from below" and stresses its link with democracy.

This tension is also evident in relation to education and sustainability. He states that it is important that education is people-oriented and that critical thinking is taught. At the same time, sustainability is an urgent concern. A deeper analysis of his descriptions makes it clear that for him sustainability is a conviction that is expressed above all in specific actions.

> *For me it became a problem, when I was somehow also talking about transport or I had a project about transport, and then I drove to school from time to time, at that time I still had a car, and it was one of the reasons why I got rid of it. Because I thought, because I'm always embarrassed, because then I sometimes looked, if someone sees me. That was already a clear reason for me, one of three reasons.*

The same applies to his reflections about his students. Even before William receives the students' statements, it becomes apparent that William – similar to Marlies – views one criterion of teaching success as a change in individual student behavior:

> *So a key moment was when I was still a trainee teacher, and there was a very well-known film, actually the first one that presented it in such a networked and systematic way, it was about eating meat. Those were all the disadvantages of eating meat. So on different levels and then half a year later a student told me that because of what we did in class he became a vegetarian. I thought it was great that somehow, you know, you've achieved something.*

When evaluating the video sequence, it is clear that William (like Paul) first adopts a teacher habitus and evaluates the sequence from a didactic point of view (especially the correctness of content). Subsequently, his orientation towards addressing tensions and contradictions in sustainability and education becomes apparent. William is initially strong on the issue of non-sustainably produced clothing being a big problem, but at the same time he is oriented towards the students and makes it clear that some students cannot afford expensive clothes. He explicitly rejects a moralizing attitude on the part of the teacher.

The evaluation of the student statements in the third part of the interview is education-oriented, and is about the conflict between agent and object. In contrast to Marlies, he considers the statements of group A and B to be "similar". He is concerned with the relationship between individual and subject. Like Marlies, he would add information to such reactions and try to inspire his students by means of knowledge or empathy, but with the aim that the students deal with the topic more intensively.

Conclusions and Discussion

The results show first (and again) how different the orientation of teachers in the context of education and sustainability can be. The three traditions from environmental education have been partially confirmed and deeper questions in relation to them are

revealed. In the following, the results will be described and discussed in summary with regard to how they deal with the tensions described in the introduction.

The case of Marlies shows that by concentrating on specific issues, which she deals with by focusing on individual (student) action, it is possible to avoid the tension. This is supported by the separation of the courses. In her lessons she informs the pupils with factual knowledge, and in workshops she does projects together with the pupils, which are understood as voluntary offers. Marlies or the teachers assigned to her type can be assigned to the normative tradition. For her, the subject matter is morally unambiguous: knowledge of certain facts automatically goes hand in hand with moral judgment. Certain facts that are supposed to clear up grievances should awaken the students' awareness and, in the best case, they will derive specific actions from them. But what is striking – in contrast to the description of the normative tradition – is that it is less an individual change in values but rather an increase in knowledge that carries with it particular values. Thus, parts of the fact-based tradition and the normative tradition are combined in this case.

Paul's case shows strong features of the pluralist tradition. He attaches great importance to multi-perspectivity and systems thinking. The same is true of the assessment of the pupils, who are evaluated both in terms of their ability to think in a networked way and from a pedagogical perspective. The latter refers to the self-efficacy of the pupils and thus to the question of whether they are convinced that their actions can change anything. The aspects mentioned by Paul are important criteria for ESD. At the same time, however, it is reasonable to assume that his distance to the subject matter makes it possible to adopt this attitude. Only one other teacher in the sample showed such a distance to the topic. Here, too, it became clear that the lessons' success was not so much based on the individual actions of the students, but on changes to their thinking.

Most of the teachers interviewed in the sample can be classified similarly to William's case. They show a private relation to the topic and inform themselves about the topic. As was shown in the case presentation, the tension cannot be resolved: this type is also concerned with social change and therefore teaching success is predominantly evaluated as a change in student behavior. However, unlike with Marlies, this is not formulated as an explicit goal. Rather, the teachers refer to general educational goals and emphasize that they should not or do not want to call on students to act. This explicitly addressed tension is also related to another thematic focus: in contrast to the first type, in which privately engaged teachers are also found, the topics that teachers from the last type address in their lessons focus more on political and social contexts. At this level, it is not possible to derive clear actions, nor is it assumed that individual action alone can bring about change.

This study identified initial indications of how teachers deal with the tensions in the context of education and sustainability. The first two cases show how the tension can be avoided: in the first case, the focus is on simple facts that are followed by a clear judgement and a clear option for action. In the second case, the focus is on competences. The third type explicitly addresses the tension.

Two points are of particular interest for teacher training. First, it becomes clear how important it is to acknowledge the tensions in teacher education. This sample of responses from the study has shown that teachers who have dealt with the topic with scientific demands presented less clear solutions and included more perspectives. An extensive occupation with the subject matter and also with the tensions seems to be

necessary in teacher training if the claim to teach multi-perceptively is to be fulfilled. Secondly, the need for research on the evaluation of teachers in the context of sustainability becomes clear.

The present study has shown that teachers who feel privately connected with the topic describe a lesson as successful when students have reported a change in behavior. But this could lead teachers to having overly high expectations. More research is needed to understand this desire. It could be suspected that the private connection to the subject matter plays a role in this. Here, then, it seems to be a matter of teachers being reflective about their own desires and views. Unfortunately, the study could not provide a deeper understanding of this evaluation, specifically whether this evaluation depends more on the understanding of sustainability, the teachers' own relation to the topic or their understanding of their own role.

References

Andersson, K. (2016). Starting the pluralistic tradition of teaching? Effects of education for sustainable development (ESD) on pre-service teachers' views on teaching about sustainable development. *Environmental Education Research*, *23*(3), 436–449. https://doi.org/10.1080/13504622.2016.1174982

Applis, S. (2015). Analysis of possibilities of discussing questions of global justice in geography classes. *International Research in Geographical and Environmental Education*, *24*(3), 273–285. https://doi.org/10.1080/10382046.2015.1034461

Bohnsack, R., Pfaff, N., & Weller, W. (Eds.) (2010). *Qualitative analysis and documentary method in international educational research*. B. Budrich.

Borg, C., Gericke, N., Höglund, H. O., & Bergman, E. (2012). The barriers encountered by teachers implementing education for sustainable development: Discipline-bound differences and teaching traditions. *Research in Science & Technological Education*, *30*(2), 185–207. https://doi.org/10.1080/02635143.2012.699891

Corney, G. (2006). Education for sustainable development: An empirical study of the tensions and challenges faced by geography student teachers. *International Research in Geographical and Environmental Education*, *15*(3), 224–240. https://doi.org/10.2167/irgee194.0

Gresch, H., & Martens, M. (2018). Teleology as a tacit dimension of teaching and learning evolution: A sociological approach to classroom interaction. *Journal for Research in Science Teaching*, *56*(3), 1–27. https://doi.org/10.1002/tea.21518

Holfelder, A. K. (2020). Implicit knowledge in the context of ESD: Students' orientations towards sustainability-related topics. *Journal of Education for Sustainable Development*, *14*(1), 20–40.

Jickling, B., & Wals, A. E. J. (2008). Globalization and environmental education: Looking beyond sustainable development. *Journal of Curriculum Studies*, *40*(1), 1–21. https://doi.org/ 10.1080/00220270701684667

Kater-Wettstädt, L. (2017). How secondary-school students deal with issues of sustainable development in class. *Environmental Education Research*, *24*(11), 1565–1580. https://doi.org.10.1080/13504622.2017.1373068

KMK & BMBF. (2016). Orientierungsrahmen für den Lernbereich Globale Entwicklung [Orientation framework for the learning area Global Development]. Cornelsen.

Mannheim, K. (1982). *Structures of Thinking*. Routledge.

Öhman, J., & Öhman, M. (2012). Participatory approach in practice – an analysis of student discussions about climate change. *Environmental Education Research*, *19*(3), 1–18. https://doi.org.10.1080/13504622.2012.695012

Sandell, K., Öhman, J., & Östman, L. (2005). *Education for sustainable development. Nature, school and democracy*. Studentlitteratur.

Singer-Brodowski, M., Brock, A., Etzkorn, N., & Otte, I. (2018). Monitoring of education for sustainable development in Germany – Insights from early childhood education, school and higher education. *Environmental Education Research*, *25*(4), 492–507. https://doi.org/10.1080/13504622.2018.1440380

Summers, M., Childs, A., & Corney, G. (2005). Education for sustainable development in initial teacher training: issues for interdisciplinary collaboration. *Environmental Education Research*, *11*(5), 623–647. https://doi.org/10.1080/13504620500169841

Sund, P. (2015). Experienced ESD schoolteachers' teaching – an issue of complexity. *Environmental Education Research*, *21*(1), 24–44. https://doi.org/10.1080/13504622.2013.862614

Correspondence concerning this paper should be addressed to Anne-Katrin Holfelder, Institute for Advanced Sustainability Studies, Potsdam, Germany. Email: anne.holfelder@googlemail.com