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The climate crisis as an impetus for learning: Approaching environmental education from learners' perspectives[1]

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Abstract

This contribution examines the kinds of situations in which people begin to learn in the context of the climate crisis. This approach differs from how learning is usually debated in environmental education, which typically focuses on why adults should learn and how this learning can be induced by educational efforts. To understand why and how adults initiate learning, we engage with the debate on concepts of exploring 'impetuses for learning' (Lernanlässe), which has been a topic of discussion in the German-speaking context over the past decades. We explore how this concept provides an empirical perspective on the diverse contexts in which adult learning currently occurs and could potentially occur in the future as the climate crisis continues to unfold.

Keywords: ecology, learning contexts, mass media, social movements, organisations

Introduction

While there is no shortage of demands to address environmental problems through *teaching*, empirical analyses of how *learning* in a range of specific social contexts is related to environmental issues and the climate crisis are rare. One possible explanation for this may be that an important difference has not yet been sufficiently discussed: the distinction between learning requirements as a programmatic agenda and the actual ways in which adults encounter the climate crisis as an impetus for learning. This is astonishing, since a common feature of theories of adult education and learning is their focus on learners' perspectives. Theories of adult education highlight, for example, the learner's reasons for learning (Knowles, 1984), how learning processes unfold in biographical

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situations of self-questioning (Mezirow, 2000), how learning is accomplished by experience (Merriam et al., 2007), or how it is situated in individual biographies (Alheit et al., 1995).

Discussions regarding how and what adults learn in relation to the climate crisis usually do not involve such considerations so far. Instead of asking why and how adults *actually begin to*—or rather tend not to—learn, the focus is on why and what adults *have to* learn and what (adult) educators can do to induce such learning, for example by adopting a respective policy agenda such as the Sustainable Development Goals by the United Nations (UN). With this paper, we aim to encourage efforts addressing this issue by asking how and in which ways adults understand the climate crisis as something relevant for their learning. Therefore, we align with one particular strand of adult learning theory, which we consider helpful in this regard. This research perspective begins from the question, how and why adults begin to make efforts to learn. We refer to a certain way of discussing this question, which has been developing within the German-speaking context and unfolds around the term *Lernanlass*. Unfortunately, there appears to be no one singular translation of this term in English which encompasses all its semiotic references. *'Occasions for learning'* has previously been used (Ludwig, 2017, p. 52; Rosemann, 2021), but this translation may imply the impression that these occasions occur randomly and that learners may, or may not, take advantage of them. *'Inducements to learning'* highlights the consequentiality of the genesis of learning situations, but could also imply that beginning to learn depends on external incentives. We have chosen to mainly use the term *'impetus for learning*' in this paper, placing an emphasis on the situative constellations and dynamics in which learning and learning efforts unfold.

As a starting point, we take a critical look at concepts of environmental education which aim to justify why learning in the current ecological crisis is necessary. We emphasise that these concepts do not assign systematic importance to how *learning* originates: instead, the environmental crisis appears to be an impetus for *teaching* (Section: The environmental crisis as an impetus for teaching).

We then delve into three models that suggest different approaches to explain the genesis of an impetus for learning. First, learning is discussed as something which emerges while people attempt to solve problems as they pursue their individual reasons for actions (Holzkamp, 1995). Second, learning is discussed as something that is driven by interests which have emerged in the past (Grotlüschen, 2010). Finally, learning is discussed as something which originates from disconcerting experiences of foreignness (Schäffter, 1997) (Section: How does an impetus for learning emerge?).

Our third step expands the focus of these models on how the impetus of individual learning emerges by examining the social contexts within which impetuses for learning originate. We discuss the situatedness of learning occasions exemplarily with reference to three specific contexts: mass media, social movements, and organisations (Section: When does an impetus for learning emerge?).

This paper concludes by discussing the opportunities for analysing adults' learning in the climate crisis that may arise from empirical research on how an impetus for learning unfolds within the specific social contexts in which adults live their lives (Section: Reflection).

The environmental crisis as an impetus for teaching: A short critical review of the development of environmental education

The usual manner of relating learning issues to environmental ones is to deduce learning needs from environmental problems. This can be illustrated by the following three examples from different decades.

Environmental education emerged from the growing awareness of the threat posed by environmental degradation in the late 1960s. Debates on Environmentalism implicated that complex environmental problems cannot be solved only at a political or only at a scientific level. The interplay between demands from scientists, particularly in the USA, for greater social awareness of ecological problems and the emphasis on education by political actors (e.g. UN, 1973) led to the development of the initial concepts of environmental education (Gough, 2012). Educational institutions were considered to play a key role in the imparting of environmental education. The primary goal of the 1972 UN Conference on the Human Environment in Stockholm, for example, was to develop environmental education as part of organised education, with a particular focus on schooling (UNESCO-UNEP, 1990; Environmental Education Research, 2006). The transfer of the problem of environmental degradation to educational institutions resulted in a pedagogisation of the ecological question (Proske, 2002).

In addition to the focus on educational institutions, a discourse emerged in the 1970s in which the crises of the time (including environmental issues) were linked directly to expect learning from everyone (and not only to expect a provision of respective teaching offers): the UNESCO study on lifelong learning, *Learning to Be* (Faure et al., 1972), addresses potential risks to humanity from additional uncontrolled technological advances. It argues that everyone has to have the opportunity to learn if humanity is to gain the awareness and skills that are needed to use and shape technology in beneficial ways. Botkin et al.'s (1979/1998) *Learning Report*, written for the Club of Rome, laments the 'human gap', 'the distance between growing complexity and our capacity to cope with it' (p. 6) and the fact that 'men and women are as yet unable to grasp fully the meaning and consequences of what they are doing' (Peccei, 1979/1998, xiii). In this light, the 'report examines how learning can help to bridge the human gap' (Botkin et al., 1979/1998, p. 8). The report criticises contemporary modes of learning for not yet having prepared society for the complex challenges ahead, it sees itself as a stimulus for discussion on innovative forms of learning: 'What we do assert is that *innovative learning is a necessary means of preparing individuals and societies to act in concert in new situations*, especially those that have been, and continue to be, created by humanity itself' (Botkin et al., 1979/1998, p. 12; emphasis added).

At the end of the 1980s and beginning of the 1990s, the debate on environmental issues coalesced around the idea of sustainability (UN, 1987), now focussing operational goals striving for a society which meets ecological as well as, social and economical demands. Agenda 21 sets out the concept of Education for Sustainable Development at a global level (UN, 1992), which was/is not only discussed in relation to school education but also extensively discussed in higher education (Acosta Castellanos & Queiruga-Dios, 2022). Its implementation has also become relevant for adult education (Schreiber-Barsch & Mauch 2019). Learning is, thus, addressed as a means for achieving these goals. However, such references to the concept of Education for Sustainable Development often fail to take into account, how adult education differs from school education (for an overview of the discussion on climate crisis and sustainability in adult education see e. g. Michelsen 2020, Schüßler & Schreiber-Barsch 2021). Notably, the individuality and the situated nature of adult learners' knowledge are not further scrutinized. Instead,

competences are defined, which adults have to develop in order to cope with ecological challenges; that implies shifting the responsibility for dealing with the climate crisis to an individual level. Yet, how adults individually relate to their own learning is not considered in further detail.

The various examples of dealing with environmental issues illustrate that a common method of establishing a connection between ecology and learning is, firstly, to state that an environmental problem exists, and, secondly, to derive a necessity that learning must take place. This necessity for learning is seen to demand a necessity for teaching in order to induce the required learning. Thus, the climate crisis is rather treated as an *impetus for teaching.*

Vital questions remain unasked and unanswered within the horizon of such a perspective, as it fails to take notice of where, how, and by what means the ecological question has already become a subject of the learning of adults.

How does an impetus for learning emerge? – individual-centred models

We propose that the concept of 'impetuses for learning' can be drawn on to delineate the difference between educators' and learners' perspectives more clearly and thereby open up an empirical perspective on contexts in which adult learning actually unfolds in relation to the climate crisis. The guiding question is how and in which ways impetuses for learning emerge in the context of the climate crisis.

To clarify the potential for such a line of enquiry, we first elaborate on three differing approaches that describe processes in which learning originates: an approach which emphasises the perception of problems arising in the course of intentional actions, an approach focusing on the dynamics of developing interests, and an approach that foregrounds disorienting experiences of strangeness or foreignness. We have selected these approaches because each of them, from a different angle, examines processes in which adults relate to the world and to themselves by means of learning. We interrogate and compare these three approaches to further nuance what they contribute to the analysis of how the climate crisis may lead to impetuses for learning.

Handling problems arising in the course of actions: Klaus Holzkamp's subject-centred learning theory

In the German literature on adult learning, Klaus Holzkamp's subject-centred learning theory (Holzkamp, 1995) holds a prominent place as it opens up a deeper understanding of learners' perspectives on their acting and learning (for a discussion of this concept in an international context see Illeris, 2007).

This model of how impetuses of learning emerge locates learning within courses of action and highlights the subjective perspective of individuals and their reasons for acting and, possibly, learning. Learning becomes an option for subjects when they are involved in actions, consciously pursuing self-defined goals, and realising that they cannot reach the desired results. Learning becomes necessary when 'coping with the problem in the normal course of action does not seem possible due to obstacles, contradictions, or dilemmas' (Holzkamp, 1995, p. 183; translated by the authors). The subjects' encountering of such action problems does not always lead them to a learning action; they consider learning as relevant only when the failure to achieve the goal is traced back to the specific conditions and prerequisites of their acting, and learning is perceived as an

opportunity to overcome the obstacle that has been encountered. In this case 'the detour of adding a learning loop' is taken (Holzkamp, 1995, p. 183; translated by the authors).

Holzkamp's model suggests that an impetus for learning can only arise in contexts in which action is already being taken intentionally and for reasons an individual considers justified. In addition, the problems linked to this action have to be consciously perceived: problems only become problems when they manifest as obstacles standing in the way of achieving a selected goal. Thinking of learning in this manner reveals a gap between claiming that learning is inevitable because of societal problems (such as the climate crisis) and asking from where impetuses for adults' individual learning efforts originate.

According to this concept, adults may not perceive any need for learning when the ecological consequences of their actions do not directly affect themselves or when these consequences may even be not perceived by them at all. This might explain, why some adults experience no impetus for learning since there is no immediate and self-evident link between individual actions and the problems caused by climate change. The problematic effects of climate-changing actions only become evident to the individual once the consequences of numerous actions have sufficiently accumulated to become a problem. In addition, causes and effects are related over long temporal and vast spatial distances, only coming to light in the course of complex scientific observations and analyses. Where consequences of climate change cause severe harm, these are actually perceived as problems that represent obstacles to individual action, but it is not only and not necessarily those people who suffer the problems, who would have to act differently to 'cure' the problems.

This leads to the question of how (and to what extent) adults see the climate crisis as a problem that makes their successful pursuit of their own action goals appear doubtful. To what extent, in what way, and for whom do subjectively relevant action problems arise from the climate crisis? In what contexts are these action problems perceived in such a manner that inserting a learning loop appears to offer an expedient approach to tackling them? And in which contexts do adults perceive problems resulting from the perception of a climate crisis which motivates them not to learn or to resist learning expectations? When we refer to questions of this type below, we use the term 'problems in action' to indicate the reference.

Becoming interested: The theory of interest development elaborated by Anke Grotlüschen

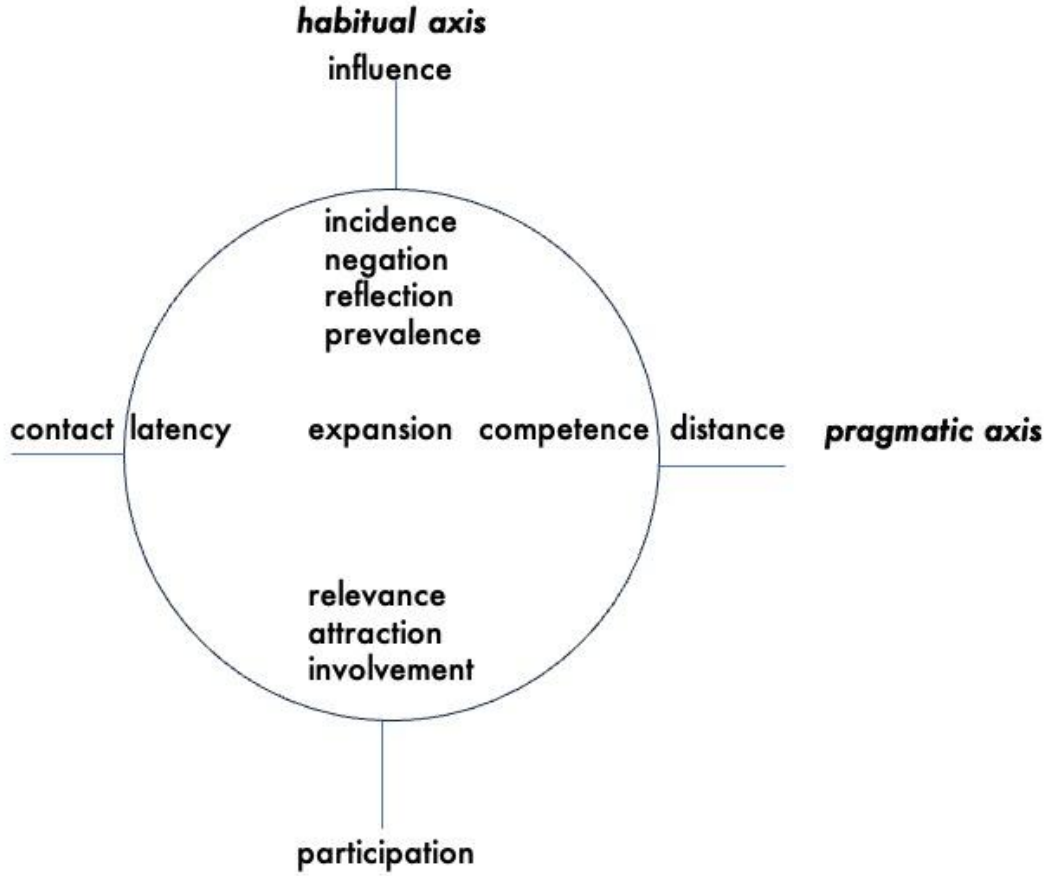
The second concept of 'learning impetus' discussed in this paper emphasises dynamics which may lead to learning, but unfold long before actions are taken, even before reasons for action are considered. On the basis of qualitative interviews, Anke Grotlüschen (2010) suggested a model of how interests develop over the course of one's life. This is of critical relevance for the understanding of impetuses for learning since learning efforts derive from interests (see also Dewey, 1913). Grotlüschen elaborates that the development of interests depends on how one comes into contact with a subject matter and how one's relationship with it evolves over time. Her concept of interest development seeks to systematically capture processes of engaging with objects of interest that take place even when individuals are not (or not yet) consciously and intentionally interacting with them.

Understanding interest as a 'cyclical relationship between an actor and an object of interest that has been appraised as relevant and attractive' (Grotlüschen, 2010, p. 183; translated by the authors) opens up opportunities to pinpoint moments of rather diffuse interest at the beginning of processes of interest development. In this context, it becomes

evident that interest development is embedded in social processes and takes place against the background of historical and economic situations (Grotlüschen & Krämer, 2009).

The process of interest development is conceptualised in terms of two dimensions linked in an orthogonal relationship (see Fig. 1). The poles of the habitual axis are distinguished as ‘influences’ and ‘participation’, and the poles of the pragmatic axis as ‘contact’ and ‘distance’. The starting point for interest development—the essential prerequisite for it—is an initial contact with an object of potential interest. This contact activates individual relevance systems and the acting subject assigns meaning to the external object (Grotlüschen, 2010, p. 214). Contacts, as Grotlüschen induces from the empirical material, can emerge as isolated (a contact as a single event), continuous (an unspecific initial contact that persists over time), diffuse (the contact is not remembered), or considered (a conscious decision/a decision that has been thought through) (Grotlüschen, 2010, pp. 190–200). Retrospective accounts of contacts tend to attribute a degree of apparent, almost self-evident, continuity to them (Grotlüschen & Krämer, 2009, p. 26). In reference to such continuities the respondents cannot identify specific points in time, but only ongoing experiences.

Figure 1: Genesis of interests at the juncture of two axes. Source: (Grotlüschen, 2020, p. 291; translated by the authors)



After the initial contact phase, interest development unfolds in three subsequent phases: In the latency phase, the possibly developing interest is still very fragile and may fizzle out (Grotlüschen, 2010, p. 200). In the expansion phase, the interest stabilises, and specialisation takes place; for this to occur, opportunities for participation have to be taken. In the competence phase, when interests have already been stabilised, subjects

frequently have ‘considerable and differentiated knowledge’ which has, by no means, already reached saturation (Grotlüschen, 2010, p. 209; translated by the authors). It is also possible that after interests have been developed, a fourth phase of distancing occurs when interest drops off.

Considering these observations, it is evident that an analysis of the genesis of impetuses for learning must necessarily also take into account the range of social contexts in which interest arises, since ‘every contact with objects of interest... depends on the people and resources in the subject’s environment and every appraisal of the factors involved in a contact... depends on the practical or aesthetic yardsticks the acting subject has acquired in their milieu of origin’ (Grotlüschen, 2010, p. 186; translated by the authors).

The question of how the climate crisis becomes an origination of learning can be asked more specifically with the help of this model. How, and in what specific social contexts, do adults come into contact with events, concepts and problematisations linked to the climate crisis? How does their relationship with these concepts and problematisations unfold? How do they relate to them, and what conditions exist in their contexts that could support the progression of interest development or may lead them to avoid the issue? And which developed interests could hinder adults from learning related to the challenges of the climate crisis? When we refer to such questions below, we use the term ‘developed interests’ to indicate the reference.

Being puzzled: Ortfried Schäffter’s relational model of dealing with foreignness

The third approach presented in this paper highlights a certain type of social constellation in which individuals may find themselves. Ortfried Schäffter (1997) suggests focusing on relationships between contexts in which adults feel a sense of belonging and those which they experience as foreign. As adults perceive themselves and the world from their ‘own position and angle of vision’ (Schäffter, 1997, p. 93; translated by the authors), potential impetuses for learning arise as soon as they are confronted with a plurality of social contexts and positions. Such experiences of strangeness or foreignness have the potential to induce learning.

Here, foreignness is defined relative to the self and what the self considers its familiar own. As foreignness is experienced, lines of difference are drawn that distinguish incomparable contexts (Schäffter, 1997, p. 94) and thereby simultaneously create a relationship among them. The boundaries drawn in this manner become contact surfaces that involve mutual interaction, contact, as well as frictions (Schäffter, 1997, p. 118). What is of significance in this process is not that boundaries are dismantled in a search for commonality but that ‘distinctions that create meaning’ necessarily remain and are understood as productive (Schäffter, 1997, p. 119; translated by the authors). Only through the experience of boundaries does the possibility of fleetingly crossing them become possible.

What is strange or foreign to a given adult because of their specific social positionality is ‘experienced as offering resistance and (not only in a positive way) as surprising’ (Schäffter, 1997, p. 120; translated by the authors). This experience induces confusions that can become a ‘mobilisation event’ (Schäffter, 1997, p. 122; translated by the authors). However, learning is only one possible option and by no means the ‘normal form’ of dealing with such disconcerting experiences. Rather, learning related to foreignness is ‘a demanding, higher-level special reaction’ (Schäffter, 1997, p. 122; translated by the authors). Often, possibly puzzling aspects are either not registered at all

(normalisation strategy) or individuals focus on the aspects that meet their expectations and see deviations as trivial or banalise them by framing them in familiar contextualisations (Schäffter, 1997, p. 121). Being disconcerted only becomes a trigger for learning 'once other reactions fail' (Schäffter, 1997, p. 123) and 'the presupposed normative profile structuring expectations no longer seems applicable' (Schäffter, 2001, p. 190; translated by the authors). Disconcertment may only be endured when the experience of being puzzled is accepted (see also Kolb, 2014). The relationship between knowledge and non-knowledge is still undetermined at this stage. However, the more non-knowledge becomes undeniable an impetus for learning may emerge, and, the more likely a searching movement may unset 'on which a plurality of learning structures may attach' (Schäffter, 2001, p. 191; translated by the authors).

Schäffter's suggested model of how learning originates draws attention to the significance of the plurality of social contexts that each have their own horizons within which knowledge is deemed valid and relevant (see also Dinkelaker et al., 2020; Dinkelaker, 2024). This perspective is eye-opening for an analysis of how learning derives from the climate crisis, because 'climate change' is a phenomenon that spans highly diverse social and environmental contexts and in which 'geophysical elements intermesh with social, economic, and political processes and institutions' (Stehr & Machin, 2019, p. 9; translated by the authors). This implies that climate change is not only a relevant research area for many scholarly disciplines but also an issue that people grapple with in diverse contexts beyond that of academic research (Callison, 2014). Knowledge that is drawn on to deal with climate change emerges in highly diverse contexts; however, it is communicated across the boundaries of these contexts, and every crossing of boundaries is a potential occasion for experiencing foreignness. This indicates that an examination of how the climate crisis becomes an origination of learning must also analyse the ways in which processing the problems of climate change leads to relationships and exchanges between a diverse variety of knowledge-generating and knowledge-applying contexts. When we refer to relations of this type below, we use the term 'experienced foreignness' to indicate the reference.

When does an impetus for learning emerge? Examples for the situatedness of learning in social contexts

The previous section showed that the analysis of learners' impetuses for learning must necessarily consider the social contexts in which individuals are involved. Therefore, asking how the climate crisis becomes an impetus for learning leads to a scrutiny of the contexts in which climate-related issues emerge. We will illustrate this with exploratory observations from three different contexts.

The examples serve to illustrate the argument that the empirical analysis of social contexts is a necessary part of examining how learning originates. They also illustrate the wide variety of contexts in which the climate crisis can become an impetus for learning, although they do not, of course, represent a complete survey of contexts in which learning is induced by the climate crisis.

The call for individual self-education by mass media

Our first example concerns thematisations of climate-related knowledge in mass media. The numerous and diverse formats in which climate knowledge is delivered can be distinguished in terms of how these formats approach and answer the following question:

'Why are individuals seeking this knowledge?' As media producers can only have limited insights into the individual impetuses for learning that motivate their audiences, they have to resort to assumptions and conjectures regarding the ways in which the global climate gains relevance to individuals.

Guides and self-improvement books promise to empower readers to deal with practical problems of everyday life (Dinkelaker, 2022a). Hence, the action contexts (*problems of action*) that are invoked when adults are addressed as people with an interest in climate-related learning (*developed interests*) can be identified by scrutinising such literature.

In the following, we compare four guides that deal with the climate crisis and which had been selected according to the results of a web search in the year 2020. The German search terms *Klima* (climate) and *Ratgeber* (literally 'giver of advice', but widely used as a description for the genre of companions, self-help, or self-improvement literature) were used. Care was taken to ensure that the selected guides adopted different approaches to stating the problem that they address (Dinkelaker, 2022a).[2]

The premise of the guide called 'Klimasparbuch Eurodistrikt Strasbourg-Ortenau' ('Eurodistrict Strasbourg-Ortenau Climate Savings Book'; translated by the authors) is that readers can save money and energy by following the advice and using the vouchers it contains (EVTZ Eurodistrikt Strasbourg-Ortenau & oekom e.V., 2019, p. 3). This companion links the collective problem of saving energy to an opportunity to make progress on the individual problem of reducing one's cost of living.

The slim volume 'Every Day for Future' (Prima Klima E.V., 2019) presents 100 suggestions for people motivated by Greta Thunberg's example to take action themselves to address climate change. The proposals for action in this companion begin from the premise that the reader will be affected by climate change in the future and changing one's own ways of acting now can immediately help to mitigate this looming disaster.

'Der Klima-Knigge' ('The Climate Book of Etiquette'; translated by the authors) promises to familiarise readers with essential aspects of adopting a lifestyle suitable for meeting the challenges posed by climate change (Grießhammer, 2007). The problem that is assumed to be the readers' motivation for reading the guide is that they desire to be perceived as responding to the collective challenge of climate change, yet lack knowledge of appropriate actions and which factors climate-savvy behaviour needs to consider.

Finally, the autobiographical companion by German TV presenter Janine Steeger, 'Going Green', advertises that the book explains 'why one doesn't have to be perfect to protect the climate' (Steeger, 2020; translated by the authors). The problem emphasised in this guide is that making lifestyle changes in order to mitigate climate change challenges the handling of expectations of one's social circles and balancing one's self-identity.

The guides presented here appear to provide answers to *learning motivations deriving from individual actions* and offer help for individuals who are in their own learning loops (*problems in action*). Yet, these media offers do not solely react to questions that have already emerged. Although the rhetoric of giving advice presupposes that a problem already exists, the books in fact suggest possible motivations which potential readers may wish to adopt. The opportunities for knowledge transfer and self-examination offered in these media are presented to readers as specific suggestions for how they can understand their own life situations and the connections of these situations to the environmental problems facing society and how this can be used as opportunities for individual learning (Carvalho, 2010). Hence, these media offerings should be considered as potential originations of learning in and of themselves.

Further, these guides assume that readers have already come into contact with the climate issue. They, hence, come in at an advanced moment in the *formation of interests* (*developed interests*). These contacts are taken as the starting point for presenting readers with new aspects that they may not yet have considered. The guides portray themselves as authoritative sources that can be consulted for the purpose of deepening an interest. Thus, the focus is more on offering readers opportunities to identify with what gives them a familiar sense of belonging than on confronting them with *disconcerting foreignness* (*experienced foreignness*). The information in the guides that is expected to be new and different for readers is plausibilised in the context of the background experiences that they are assumed to have already had. In this context of media-based knowledge transfer, it is precisely the deproblematisation of differences that creates the conditions for dealing with what is still unknown.

Collective self-pedagogization and impetuses for teaching in climate movements

Our second example for the social contextualisation of individual occasions for learning is drawn from the context of social movements (on learning in social/environmental movements, see, among others, Foley, 1999; Hall et al., 2012; Kluttz & Walter, 2018; Ollis, 2021; Pasino, 2023; Trumann, 2019; Walter, 2007). This example encompasses a range of contexts in which impetuses, not only for individual learning but also for collective learning efforts, are discussed.

As an example, we observed the Transition Town movement in the context of a student research project that was part of a seminar entitled ‘The Social Significance of Adult Learning: The Example of the Climate Crisis’ (translated by the authors) and took place in the year 2021 at the Martin-Luther-University in Halle, Germany. The Transition Town movement was sparked by an appeal made by a single individual in Great Britain in 2006; it is organised in a decentralised manner in numerous cities worldwide and sees itself—as ‘The Essential Guide to Doing Transition’ puts it—as a ‘learning network’ that ‘can create change more quickly and more effectively, drawing on each other’s experiences and insights’ (Transition Network, 2016, p. 9). The aim is to enable each and every individual to make a contribution in their own way to collectively bring about an ‘influence change’, ‘developing and guiding social and economic systems toward sustainability, social justice, and equity’ (Transition Network, 2023). The kind of initiatives that arise within the movement range from organising swap shops and consumerism-critical urban walks, to developing future-oriented spaces such as community gardens, urban farms, and kitchens. The starting point for the student research project was an overview of these various initiatives of the movement provided on the following web address: https://www.transition-initiativen.org/liste-der-transition-initiativen. The examples for the research project were compiled on activities undertaken at the local level by several Transition Town initiatives. Care was taken to capture the diversity of the activities on offer.

Unlike the contexts that involve knowledge transfer via the media , the focus here is not on claiming an individual problem, but on claiming a problem of joint action: achieving societal and cultural change (*problems in action*). Establishing and consolidating suitable forms of collaboration and cohabitation are considered a prerequisite for this. This is consequential for how impetuses for learning emerge. To begin with, the learning subject is now a ‘we’ that collectively addresses itself as a learning collective (see also Proske, 2002). The individual learning challenges arising during the pursuit of this collective learning mission recede into the background. Instead,

a structure of learning impetuses is emphasised that arises out of shared concerns and a shared commitment to change. This creates a focus on unsolved action problems (relating to the shared goal of living in a climate-friendly manner) that only can be countered by entering *collective learning loops* with a focus on experimenting with new ways of acting. Further, networking with other groups and working at the local level is anticipated to boost creativity and the effectiveness with which ideas can be realised.

In this movement, *experienced foreignness* arises as a topic when the groups attempt outreach aimed at people who have not (yet) joined the movement. In this context, foreignness initially appears not as an impetus for learning but rather as an impetus for teaching. Because the movement aims to spread through society, its learning efforts are directed both inwards and outwards and address both those who already belong and those who are potential participants. Care is taken to ensure that projects are visible to the public and can achieve the goal of awakening interests (*developed interests*). For example, they take place at locations that are easily accessible, and the threshold for becoming involved is kept low. The groups monitor their actions to track how these activities can yield impetuses for learning for others. They consider the action problems that confront people and which they can address with their solutions (for example, a mobile kitchen with a sustainable food offer to solve the problem of catering at events). The groups think about how they can ensure *developing interest* in relevant topics (for example, by installing signs to mark trees endangered by climate change in a public park) and reflect on how *experienced foreignness* can be designed in a manner that opens up the scope for productive responses.

Thus, the movement is based on an implicit model of initially marginal participation leading to people taking on progressively greater responsibilities (Lave & Wenger, 1991). It seeks opportunities to bring people who are not yet engaged in the movement into contact with its topics and projects. It invites people to get involved and, in the process, to differentiate and deepen their interest in specific topics (*developed interests*). Finally, it also requires the participation of people who have already reached the 'competence phase' of interest development. Treating the problems that the movement tackles in the course of its work as challenges of collective learning leads to situating the different levels of interest development within an overarching shared framework.

Making collective and individual impetuses for learning a subject of discussion in this manner creates a context of self-examination in which individual learning can potentially emerge by being involved in joint action.

Organisational roles dealing with climate-related issues

Role expectations in organisations represent a third example of how dealing with the climate crisis in social contexts induces impetuses for individual learning. Members of an organisation come into contact with climate-relevant problems whenever climate goals are defined, and climate decisions are prepared and taken there. The individuals' organisational roles and the tasks they entail then become a potential inducement to learning.

One example of members of organisations coming into contact with climate issues is the Climate Alliance, a European network of cities, districts, federal states, NGOs, and other organisations with a focus on achieving climate change mitigation at the local level (Boswell et al., 2012; Damsøn et al., 2016). In 1992, the City of Halle (Saale), situated in the Eastern part of Germany with roughly 240.000 inhabitants, joined this organisation, thereby committing itself to steadily reducing local greenhouse gas emissions in line with the goals of the Paris Climate Agreement.

The observations presented below were made by the authors in the context of a pilot study in the year 2021 undertaken in the context of preparing an application for a third-party research funding, striving for a project that reconstructs the communication of climate knowledge across different social contexts.[3]

The first local authority climate action plan of the City of Halle (Saale) was developed in 2013 and is regularly updated (City of Halle [Saale], 2020). In addition to listing sub-goals to be reached by certain points in time (the achievement of which is continuously monitored), the plan also specifies action items for achieving the goals. A total of 52 items are defined and allocated to specific action areas: implementation structures, urban development, private households, companies, local authority facilities, energy supply, and transport (City of Halle [Saale], 2020).

Employees of the City of Halle (Saale) or of any of the enterprises that the city owns come into contact with these action items when a certain aspect of the delivery of these goals is situated in their sphere of responsibility. The challenges which employees find themselves confronted with vary strongly depending on where exactly their specific roles are located in the city's complex administrative and entrepreneurial structures. For example, the questions that the climate change mitigation plan raises for executives at the city-owned energy company are rather different from those it poses for staff at the city-owned housing association. The problems fielded by an employee in the established 'Service Centre for Climate Change Mitigation' are structured differently from the problems facing a city councillor who bears a share of responsibility for planning-related decisions. Whenever an organisation's member is responsible for solving a particular problem but does not yet know how to handle it and also cannot delegate the responsibility, an impetus for learning is generated (*problems in action*) (Dinkelaker, 2009). People in this situation are confronted with the need to balance the performance expectations they face, and the competences attributed to them.

How individual organisation members with their own biographical and lifeworld backgrounds react to these expectations of change is not wholly predetermined by where their roles are situated within the organisational structure. *Interest* in related topics may have been previously *developed* or the person may just be beginning to get in touch with them through changing assignments. However, the experience of being confronted with organisational goals of effecting change nevertheless becomes a shared basis for approaching learning and knowledge across the organisation.

One of the key features of Halle's climate change mitigation plan is that it aspires to involve widely diverse actors in planning and delivering the action items. Considerable significance is attached, for example, to dialogue with citizens as well as cooperation with voluntary initiatives and other organisations. Moreover, the specific process of drafting the plan and its updates is not implemented only within the city administration or city-owned enterprises. An external enterprise with specialist expertise in climate change mitigation at the regional level was commissioned to assist in drafting the plans. This diversity of actors gives rise to numerous interactions among people with diverse backgrounds in knowledge generation and knowledge application contexts. Thus, the potential for *disconcerting experiences of foreignness* to arise during these encounters is a given.

The example of the City of Halle (Saale) shows that individuals can encounter climate-relevant topics and be confronted with problems related to transitioning to climate-friendly economic activity (*problems in action*) without necessarily being motivated by personal insights into the importance of the climate issue or subjective feelings of being affected by it. They may have to deal with new, uncommon perspectives *(experienced foreignness)* purely as a result of the organisational position they occupy.

Contact with the topic (*potentially developing interest*) can result merely from being a member of an organisation and engaging with one's role in that context. The specific topics that prove to be of relevance vary depending on these organisational roles.

Therefore, to understand how the climate crisis becomes an impetus for individual learning, it is necessary to observe who is confronted and in what manner, with organisational goals and transformations prompted by the climate crisis, and how the affected people navigate the organisational issues that arise against the background of their own biographical and lifeworld positions and perspectives.

The plurality of social contexts in which impetuses for learning emerge

Taken together, the three contexts discussed as examples demonstrate that adults in a range of social contexts relate to the climate crisis in different ways and find themselves thrust into different relationships with it. The conditions in which an impetus for learning emerges depend on how people are situated in the specific contexts in which they participate. This clarifies that the climate crisis does not 'wait' for adults to engage as individual learners prompted by its issues. On the contrary, individual learning is preceded by communication regarding the structures of the problems that it addresses. Whenever the climate crisis is spoken and written about, it is interpreted in different ways and connections are established to people who are confronted with it in one specific manner or another. Therefore, in pursuing the question of how the climate crisis becomes an impetus for learning, it is important to include an examination of the processes that create relationships between the climate crisis and specific people (or groups) and the processes of addressing specific people (or groups) in this context. It then becomes possible to interrogate how such processes become occasions for adults to enter into a relationship with the issue of the climate crisis as learners (or as learning-rejecters).

Reflection: The potential of the concept 'impetus for learning' as an analytical tool

In this contribution, we inquired into the degree to which the concepts of a learning impetus enable us to gain more analytically differentiated and better empirically grounded insights into the relationship between adult learning and the climate crisis. We have shown that it is possible to understand conditions of learning in the climate crisis when we utilise these concepts. In a first step, we identified that existing conceptualisations of how impetuses for learning emerge allow climate-relevant learning to be extricated from programmatic agendas imposing societal learning expectations and instead placed in the context of a plurality of forms of individual appropriation of knowledge regarding the climate issue. We identified perceiving problems in action, developing interests, and experiencing foreignness as relevant factors from which learning processes may arise. We then emphasised the relevance of the social contexts in which individuals are engaged. Social contexts have to be taken into account in the analysis of for whom, how, and when something becomes a problem. These contexts must be considered in order to understand the opportunities, limits, and resistances that arise in the course of interest development; moreover, they have to be focused on tracing where adults encounter disconcerting foreignness.

Thus, these contexts constitute the 'conditions of acquisition' (Kade, 1993; translated by the authors) in which the climate crisis can become a starting point for learning. We sought to justify such a perspective in this article and to strengthen the necessity of

accounting for both the structure of learning impetuses with their individual significances and the structures determining the social genesis of the learning impetuses' specific constellations.

In this paper we do not deliver any arguments on which climate change related forms of learning, which learning goals or subjects of learning may be of specific relevance and which may be even misleading. The approach followed here does not allow such judgements. This does not mean, that such judgements are not of importance. Yet, they have to be discussed within other theoretical frameworks. The framework we propose allows to understand, why learning is judged to be relevant and important by learners who are engaged in it. Whether such learning is judged also from a pedagogical perspective as relevant and important remains another question, which has to be discussed elsewhere. Focusing on learners' impetuses for learning can nevertheless open up new empirical perspectives on how learning comes about in the context of the climate crisis. This approach also facilitates finding new ways of fostering learning. It helps to identify situations in which adults already learn and may need support. Focusing on impetuses for learning also assists in finding ways to initiate learning processes, whether by addressing relevant problems in action, by nurturing the development of interests, or by encouraging adults to face their experiences of foreignness. Initial considerations regarding learning in the climate crisis by asking about learners' impetuses for learning furthermore enables a critical review of teaching and learning concepts which derive learning necessities from a predefined 'objective' analysis of environmental issues.

Notes

1 The paper 'The Climate Crisis as an Impetus for Learning: Approaching Environmental Education from Learners' Perspectives' was first published in German in the *Zeitschrift für Weiterbildungsforschung*. The English version of the paper has been updated and revised content-wise. Original CC-BY license: Dinkelaker, J., & Stimm, M. (2022). Die Klimakrise als Lernanlass. *Zeitschrift für Weiterbildungsforschung*, *45*, 33-50. https://doi.org/10.1007/s40955-022-00211-z

2 The analysis focused on reconstructing the guides' construction of their addressees, the action problems the addressees were assumed to be facing, and the foundations upon which the claims to knowledge in each companion rest.

3 The analysis was based on a 'map' drawn as part of the study (based on publicly available information) to reveal internal and external cooperative relationships that were mentioned in the context of presenting the local authority's work on a climate change mitigation plan.

Declaration of conflicting interests

The authors declare no potential conflicts of interest with respect to the research, authorship or publication of this article.

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