

# Examining the emergence of collective climate agency in a multiprofessional work community

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## Abstract

**Purpose** – This study aims to investigate how collective climate agency emerged at a workplace and to contribute to intervention research.

**Design/methodology/approach** – The authors conducted a brief intervention applying Developmental Work Research to promote the collective climate agency of a school's multiprofessional work community. The data consisted of discussions on a challenging experiment.

**Findings** – The brief intervention enabled the participants to evolve into a multiprofessional collective through a common experiment. However, addressing climate change requires solutions that transcend traditional boundaries and combine professional expertise. In this case, motive conflict, which is essential to transformative agency, emerged but was not addressed, which is why the prevailing structures remained unchallenged.

**Originality/value** – Climate change research has previously paid little attention to work communities, as it has primarily focused on individual consumers and societal decision-making.

**Keywords** Learning at work, Professional agency, Workplace intervention

**Paper type** Research paper

## 1. Introduction

Climate change is manifesting globally in diverse ways and on different timelines and is challenging communities to find ecologically sustainable ways of living. It transcends the conventional boundaries of decision-making and power. A transdisciplinary approach is often needed to integrate the varied interests, experiences and expertise of different groups (McClure *et al.*, 2023; Teperi *et al.*, 2025).

Existing research has predominantly examined ecological sustainability and climate-friendly behavior in societal policymaking and sociotechnical transitions, and from individual consumer perspectives (Markrad *et al.*, 2012; Wittmayer *et al.*, 2017). Although sustainability agency has been explored in terms of, for example, employees' roles and its influence on others (Russell *et al.*, 2022), the role of work communities remains under-researched. Sustainability literature emphasizes the importance of local groups in developing practices (Thiele, 2016), but a review by Moilanen and Alasoini (2023) has highlighted a gap in the research, noting that limited attention has been paid to work communities in sustainability transitions.



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Cultural-historical activity theory (CHAT) and Developmental work research (DWR) offer a development methodology (Virkkunen and Newnham, 2013) based on the theory of collective learning (Engeström, 2015/1987). Scholars in this framework have extensive experience of workplace development. In addition, the framework has recently advocated for extending workplace-level innovations to drive societal change, which is also critical for climate change mitigation (Engeström and Sannino, 2021). CHAT-based research projects have succeeded in promoting ecological sustainability by combining collective learning theory and methods with transdisciplinary development forums (Lindley and Lotz-Sisitka, 2019; Lotz-Sisitka *et al.*, 2017; McClure *et al.*, 2023; Sannino and Engeström, 2018; Sannino *et al.*, 2018; Weaver *et al.*, 2023). These projects have enhanced participants' agency and provided practical solutions, although they have focused on pressing environmental issues and lengthy development processes rather than workplace-specific challenges.

DWR methodology enhances collective transformative agency (TA) (Sannino, 2022; Virkkunen, 2006), which is vital during challenges such as the climate change. TA emerges as a result from a systemic contradiction in work activity, which the individual experiences as a personal motive conflict and expresses by, for example, questioning prevailing practices (Engeström and Sannino, 2011; Sannino, 2022; Virkkunen, 2006). However, the need for climate change-related development is emerging in different sectors and workplaces, as different everyday challenges and at very different paces. Thorough renewal of work takes time, as it requires collective learning; combining the skills and knowledge of different professionals (Edwards, 2005; Sannino and Engeström, 2017). In addition, finding time for learning is often challenging, due to the general intensification of working life (Mauno *et al.*, 2023).

What kind of collective climate agency can brief processes achieve if the pressure for development is not yet evident in everyday work but stems from a desire for a more sustainable future? Our study used CHAT and DWR to explore how collective climate agency can emerge in a climate-related experiment in a brief DWR-based intervention involving a school's multiprofessional work community. The intervention yielded concrete results, and the participants were enthusiastic, even though the pressure for change was not apparent at the beginning of the process. It manifested as motivation based on moral and ethical considerations to act. The article aims to investigate how collective climate agency emerged during the intervention and to contribute to workplace interventions that facilitate climate actions.

## 2. Theoretical framework

We examine collective climate agency through CHAT's and DWR's principles of TA, which refers to the capacity to transcend existing constraints in work activity (Sannino, 2022; Virkkunen, 2006; Virkkunen and Newnham, 2013). TA is set in motion by contradictory motives that employees personally perceive at work, and which they often articulate as verbal expressions (Engeström and Sannino, 2011; Sannino, 2022). In professional settings, the renewal of activities requires collective TA. It requires shared recognition that change is needed to facilitate questioning of existing concepts and practices – an essential component of learning. (Virkkunen, 2006.) Edwards (2005), who has investigated the collaborative dimensions of multiprofessional working and development, emphasizes the importance of “knowing how to know who” in professional decision-making, especially when working on demanding objects of work. There is always the risk that if professionals refuse to see the new possibilities and demands for professional development (*ibid.*), the object of work does not expand.

DWR advances collective TA via formative interventions that scrutinize work as an object-oriented, mediated and historically evolving activity system (Engeström, 2015/1987; Virkkunen and Newnham, 2013). These interventions are designed to initiate expansive learning processes through encouraging questioning of current practices, ideating new ones and modeling solutions – culminating in practical experiments and the establishment of a qualitatively new activity model (ibid). The method of double stimulation (Sannino, 2022; Virkkunen and Newnham, 2013) fosters joint analyses and TA by encouraging participants to reflect on their experiences and ideas (first stimulus) in conjunction with theoretical models (second stimulus, such as conceptual frameworks; Engeström, 2015/1987). Typically, interventions begin by identifying key disturbances and articulating the developmental trajectory of the activity through historical analysis to uncover any systemic contradictions that may underlie individual motive conflicts – dead ends that cannot be resolved with existing tools (Virkkunen and Newnham, 2013). A new model of activity is created to address the contradiction and the disturbances it causes in a novel way – not as a compromise, but as a germ cell, which reconciles the seemingly opposing needs of the activity in a creative way (Sannino and Engeström, 2017). It is put to the test through developmental experiments.

However, achieving qualitative transformations is a complex, time-intensive process, contingent upon the developmental stage of the activity. It is an interplay between a push caused by contradictions and a pull offered by new solutions (Sannino and Engeström, 2017; Sannino *et al.*, 2018). Although the work community may recognize the need for development, an “intellectually understood motive” is insufficient to catalyze systemic change (Sannino and Engeström, 2017; Virkkunen, 2006).

The emergence of TA in interventions has been explored through the analysis of speaking turns: how participants question (resist or criticize) current practices, ideate new possibilities, commit to actions and report on actions taken (e.g. Haapasaari *et al.*, 2016; Heikkilä and Seppänen, 2014). Participants’ facilitative actions that aim to enhance the intervention process are also important (Clottes Heikkilä and Kurki, 2024; Virkkunen and Newnham, 2013). Turning points have been analyzed to capture the way in which agency changes during an intervention. These are moments that shape the development of agency by changing the focus of an initiative or by widening or narrowing a perspective (Haapasaari *et al.*, 2016; Scahill and Bligh, 2022). The quantity or quality of agency expression also changes distinctively (ibid.).

Even if the physical workplace is shared, forming a collective TA that transcends professional boundaries takes time. For instance, Spante *et al.* (2022) examined a CHAT-based intervention in a school setting and only noted a shift from individual commitment to collective engagement after nine development sessions. In their case, there was no initial clear, shared motive-related conflict in the work community (ibid.). In addition, their analysis (ibid.) did not show the dynamics between the different professionals when the collective emerged. In general, TA expressed by participants can reflect cultural, history-based assumptions about whose voice is heard at each stage (Lindley and Lotz-Sisitka, 2019, examining wetland management in Africa; Weaver *et al.*, 2023, describing how participating in development led to a new agentic role). Power relations also have an impact in culturally and historically more homogeneous communities when, for example, professionals and their customers co-develop services. It has been observed that the customer’s voice is better heard if they downplay their experience, and that emphasizing the experience is more likely to lead to being ignored (Weiste *et al.*, 2022).

We define climate agency as TA that focuses on climate change mitigation and adaptation. We investigated the emergence of collective climate agency using a short

multiprofessional workshop process that was motivated by a moral-ethical vision of a sustainable future (an intellectually understood motive) but not pressured by the developmental phase of the activities. Based on earlier research, our starting point was that collective climate agency requires a conflict of motives or disturbances in everyday work, which leads to the awakening of TA and the further utilization of one's own and others' professional knowledge of joint climate-related development through multiprofessional collaboration. Our research question was: What kind of collective climate agency emerged in a brief multiprofessional intervention?

3. Intervention in a school

Our data came from a research project in which a primary school's work community participated in an intervention that aimed to improve collective climate agency. The decision to participate was driven by the teachers' desire to address sustainability. Approximately six teachers, an instructor, the principal, a nutrition service manager (NSM), a kitchen supervisor (KS) and a cleaning professional were invited to the process. No such multiprofessional forum had been previously utilized at the school.

The intervention was brief in design, making it easy for the participants to take part in it alongside their work. DWR methodology provided a framework for developing through ideating and conducting experiments. The intervention consisted of three workshops (WS) and interim tasks. Figure 1 presents the script, aims and tools of each WS. The participants were interviewed before and after the intervention.

The initial interviews revealed no specific disturbances (Engeström, 2015/1987) related to climate change in the professionals' work. The interest in participating was primarily driven by common knowledge and moral-ethical considerations of environmental issues. WS1 thus focused on examining the current and near future of the professional groups' work and how climate actions were integrated into these. Deviating from DWR interventions (Virkkunen and Newnham, 2013), WS1 started with an envisioning task to inspire the participants to imagine the sustainable school of the future. Next, the facilitators presented

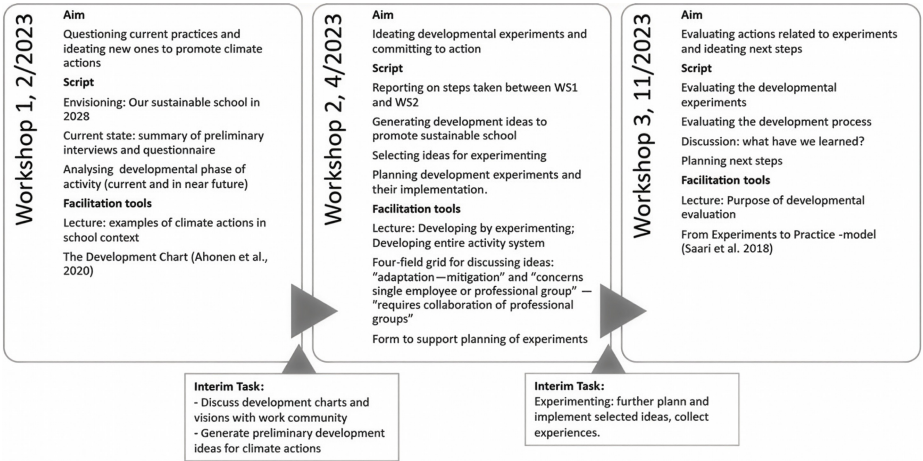


Figure 1. Intervention process  
Source(s): Authors' own work

the results of the interviews and examples from the literature on topics on which the schools had focused in their climate work. The current and future states of different professionals' work were analyzed using the Development Chart (Ahonen *et al.*, 2020). As an interim task, the participants generated preliminary development ideas.

In WS2, the participants refined the development ideas, and selected three proposals for experiments: Sort Waste, Eliminate Food Waste and Choose Veggie (CV). During a three-month pilot phase, the participants put these experiments into practice. WS3 centered on evaluating the experiments and their development processes and on planning the next steps. Sort Waste and Eliminate Food Waste progressed to the implementation phase under considerable enthusiasm. CV's idea of serving salad components separately to children led to an increase in vegetable consumption, but its main idea of enhancing vegetarian food encountered challenges. However, the participants remained positive, and generated ideas for further actions such as engaging families in the development process and influencing municipal decision-making.

Thus, despite setbacks and methodological deviations, the intervention appeared promising; the discussion was enthusiastic and focused on joint development. This prompted us to examine the emergence of collective climate agency in detail. We selected the challenging experiment, CV, for further analysis, because it evoked both critical comments and commitment.

The idea of CV was to introduce vegetarian meals to pupils and to increase the proportion of vegetarian options in school nutrition. The teachers advocated vegetarian food being served as the first option on both food lines. Meals were primarily prepared in the municipal central kitchen. During the experimentation phase, it became clear that the food distribution process was highly standardized, including its containers and carts. The full-scale implementation of CV required making changes to dishes, serving lines, transport carts and other equipment, which led to initial steps focusing on specific meals such as soups. Collaboration among the teachers, nutritionists, the municipal central kitchen and logistic services was essential for CV to be implemented.

#### 4. Data, methods and analysis

The data consisted of recorded and transcribed discussions from the three WSs' plenary discussions (~3 h/WS). Prior to data collection, the research project underwent an ethical review by the authors' affiliated institution. We informed the participants of their rights to voluntarily participate in the study verbally and in writing and obtained their written consent.

We read through all the data and discussed the overall expressions. As already noted, agency-awakening and learning are linked to motive conflicts and systemic contradictions, and often manifest as questioning (Sannino, 2022; Sannino and Engeström, 2017; Virkkunen, 2006). Thus, we studied the emergence of collective climate agency through the interaction chains of the challenging CV climate experiment.

The analysis consisted of several stages. First, we located the speech about CV by searching for sections that mentioned keywords such as "vegetarian" or "vegan." The plan was to apply TA categories from previous literature (Haapasaari *et al.*, 2016; Heikkilä and Seppänen, 2014) to classify the sections that we found. However, a review of the data highlighted that the professionals presented their expertise during the discussions and built collaboration through interaction. These aspects are essential for multiprofessional collaboration: the multiprofessional collective that the participants form should be capable of leveraging each other's expertise for joint development (Edwards, 2005). We expanded the frame by incorporating two more categories. *Building collaboration* was the agency category for when one professional invited another to collaborate or offered supportive feedback, for example. The *Providing a professional perspective* category, on the other hand, was for when

a specific feature of the speech content showed a person's professional knowledge, facts or information related to professional experience. We also noticed that the speaking turns that expressed professional perspectives typically contained an expression of TA, such as questioning. Our final categorization of speaking turns was:

- (1) Questioning (resisting or criticizing, e.g. a topic or the WS).
- (2) Ideating (reflecting and envisioning possibilities and solutions).
- (3) Committing to actions (or development steps).
- (4) Reporting on actions (steps, actions or results).
- (5) Building collaboration (e.g. encouraging, expressing appreciation or inviting to collaborate).
- (6) Providing a professional perspective (referring to professional knowledge or experience).

First, both authors independently coded the data, then we compared our coding and resolved any differences through discussion. If a speaking turn contained elements from multiple agency categories, it was coded accordingly. We noted the speaker's professional group to enable analysis of the collaboration between the professionals. If necessary, we verified the speaker's profession by listening to the original audio recording.

The coding showed active participation in the WSs across all professional groups, and the number of agency expressions increased from WS1 to WS3. The share of each category varied by professional group: the teachers focused on ideation and collaboration, while the nutrition professionals contributed with professional perspectives, and questioned and committed to the actions. In particular, the NSM frequently questioned. In addition, questioning was most often accompanied by expressions of professional perspectives, but some expressions of ideation also included a professional perspective.

Questioning is central to TA and can reveal personal motive conflicts or disturbances in the activity caused by a systemic contradiction. As the nutrition service professionals often questioned, and the teachers expressed more building collaboration, we examined how collective climate agency was shaped through these different expressions of TA and professional perspectives. Our analysis continued by locating turning points ([Haapasaari et al., 2016](#); [Scahill and Bligh, 2022](#)) in the agency expressions in relation to the CV experiment. Author 1 conducted this analysis and Author 2 reviewed and commented on the results section. When a turning point was located, it was examined as part of a larger speech segment: each utterance was examined in the context that contained the speech of both the participants and the facilitators. The length of the utterances varied from a few words to long summaries of group discussions. In this stage of the analysis, we identified a total of four turning points.

## 5. Results

We describe the results of the analysis of these turning points (TP in this section) in chronological order and highlight the differences among the professional groups. The facilitators' speaking turns were analyzed as part of the data to examine their role as promoters of the collective climate agency. Based on the descriptive result section, we answer the research question.

### 5.1 Turning points in the emergence of collective climate agency in relation to CV experiment

The following excerpts illustrate the four TPs in the emergence of collective climate agency, as examined through the expressions of TA and professional perspectives during the

discussions in WSs 2 and 3. In the tables, the teachers' speaker identifiers are workshop-specific and not speaker-specific. X marks an unidentified speaker. An omitted longer speech segment is marked by (- - -), to reduce sprawling discussion excerpts, for example, or overlapping speech that is not relevant to the analysis. Additions by authors are marked with parentheses [ ].

The discussion on CV had been preceded by the idea expressed by teachers in the WS1 (envisioning task: increasing the consumption of vegetarian food). The first TP (Table 1) occurred at the beginning of WS2 in the form of questioning by the NSM of both the intervention (the envisioning task) and the teachers' idea (as being unrealistic). Table 1 shows how these critical, resistant viewpoints of the NSM regarding the vegetarian food initiative were silenced and softened by the teacher's ideation and persuasive remarks. The facilitator eventually led the discussion to the following task in the WS2 script.

The second TP (Table 2) was marked by a shift in the NSM's expressions from outright criticism to proposing alternatives during WS2. First, a teacher described the CV plan made during the group work. We interpret that the NSM was trying to find an alternative to CV by bringing up the tools already available in nutrition services: the printed menu and an electronic application that displays the menu and enables users to give feedback on the food. Eventually, one teacher committed to trying the application, for which the NSM was grateful. The facilitator led the discussion back to the next planning assignment, and the CV idea was not questioned any further.

After this, the teacher continued to present the development plan. We interpret the discussion that followed as reflecting the third TP, when CV became a shared object of

**Table 1.** Turning point 1

| Speaking turn                                                                                                                                                                                                                                                                                                            | Interpretation                                                                                                                                                                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Turning point 1: Resisting CV on the basis of current practices</i>                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                        |
| Teacher1: We thought that vegetarian food should be visible next to regular food, so that you can actually see what is on offer. So it's not some distant, separate thing, but right there in front of you. (- - -)                                                                                                      | Ideating: presenting the group work result and the idea of a vegetarian food experiment                                                                                                                                |
| NSM: It's like a device feature – it's like when you're constructing a building, it has to be [designed] at that point                                                                                                                                                                                                   | (1) Questioning: resisting the idea<br>(2) Professional perspective: devices for food service are already selected during the construction phase                                                                       |
| Teacher1: But look, if it could somehow be placed there                                                                                                                                                                                                                                                                  | Ideating: how to place the dishes (persuasive expression)                                                                                                                                                              |
| NSM: Well, you can't put it there, we've been thinking about that for the last 20 years. Or, not that long. We've had vegetarian food for 10 years. Because it depends... I mean, if you have a soup day, then it works. If you have potatoes, gravy, maybe meatballs, then you can't put it there, because of all of it | (1) Questioning: resisting the idea<br>(2) Professional perspective: the type of food option determines whether or not the repositioning will be successful<br>(3) Professional perspective by appealing to experience |
| Teacher1: (- -) and potatoes separately, see!                                                                                                                                                                                                                                                                            | Ideating: where to place the dishes (persuasive expression)                                                                                                                                                            |
| Facilitator: You know what? Let's not solve this yet [laughter]. In the next phase, we can see (- -) what we end up doing (- -) anything else about this? (- -)                                                                                                                                                          | The facilitator interrupts the discussion and returns to the script, i.e., the following task                                                                                                                          |

**Source(s):** Authors' own work

Table 2. Turning point 2

| Speaking turn                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Interpretation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><i>Turning point 2: From questioning to ideating alternative solutions (excerpt from a longer discussion)</i></p> <p>Teacher2: So, Choose Veggie, vegetarian food displayed on both lines and [...] then we've explained that the reason pupils don't take much vegetarian food is because they don't even know what's available and they don't bother to ask if they can take it, they don't know and can't find it</p> <p>NSM: Is the menu visible?</p> <p>Teacher X: yes</p> <p>Teacher I: They don't understand; if it says beans, they simply don't understand</p> <p>NSM: (- -) We put vegetarian food as the first option. That was no small thing either, because we needed all kinds of permissions</p> <p>Teacher X: It's not listed first there, but it's listed straight after</p> <p>Teacher I: Yes, it's listed after</p> <p>Teacher X: Yes, after and in small print, but ...</p> <p>Teacher I: They don't understand or see it. (- - -)</p> <p>NSM: There's a really good development path here, since we have [this application] in use and we have a free app for smartphones. It shows all the nutritional values, all the menus, everything. If only the children would learn to use it, because there's a feedback section, and we never get enough feedback. Every Friday we go through all the city administration-specific feedback in our central kitchen, and we get very little. We get too little feedback considering the cost of the service</p> <p>KS: Some are able to use it and we get really nice feedback. You can rate the canteen environment and level of service, and it's very simple and quick to fill in. So it's like that - (- - -)</p> <p>Teacher1: (- -) or those, whatever they are, they could have the [application], so they could give all their feedback through it (- -) fourth, fifth, sixth graders, using that. (- - -)</p> <p>NSM: Wonderful. Yes, we really want that and have been waiting to get it</p> <p>The facilitator returns to the schedule by asking what else is documented in the experiment proposal</p> | <p>Ideating: Explaining the CV food initiative. Placing the vegetarian food in both food lines aims to tackle the problem of pupils not knowing what lunch options are available</p> <p>Ideating: offering an alternative solution – printed menu</p> <p>Questioning: Criticizing the use of a printed menu as it is not sufficient or does not work</p> <p>Ideating: referring to experience and challenges of placing vegetarian food first</p> <p>Questioning: Further criticism of the printed menu</p> <p>Ideating: offering an alternative solution – electronic application as a win-win solution: information for pupils and feedback to the central kitchen</p> <p>Committing to experimenting: electronic application for older pupils</p> <p>Building collaboration: expressing thanks for collaboration</p> <p>The facilitator continues the discussion on the solution and raises the next question about the form used to plan developmental experiments</p> |
| <p><b>Source(s):</b> Authors' own work</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

development for both professional groups (Table 3). The NSM did not question CV any further but stated that vegetarian food was the first choice in some schools “as it should be nowadays.” This professional view indirectly indicated that the NSM believed the teachers were on the right track in promoting vegetarian food. Interestingly, the NSM then followed the CV and ideated how it could be implemented in the school with “certain foods.” They also emphasized the importance of increasing vegetable consumption instead of aiming for everyone switching to a vegetarian diet. A teacher questioned the NSM’s first proposal for implementing the service and appealed to the professional perspective of how the children would be able to take their food, after which they agreed with the NSM’s viewpoint that learning to taste vegetarian food was important.

We interpret that CV became a shared object of development during this discussion, but with the following specific features: the original idea was teacher-oriented and the NSM committed to but placed limitations on the implementation method and the original optimistic goal expressed by the teachers. The section ends with the facilitator supporting the idea that the order of the dishes is important, after which they indicated that the discussion phase was over by asking if anyone had any more comments.

The fourth TP (Table 4) occurred in WS3, i.e. in the evaluation phase. It was marked by expressions that we interpret as indicating that the leading role in the CV experiment had changed among the professional groups – because in practice the experiment required actions from nutrition services. Both the NSM and the KS committed to CV but the speech was strongly marked by the limitation that began in WS2. The statement that “soups and casseroles” should be placed first on the line was repeated several times. The NSM also

**Table 3.** Turning point 3

| Speaking turn                                                                                                                                                                                                                                                                                                                    | Interpretation                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Turning point 3: Committing to a shared object of development but placing limitations on the CV idea</i>                                                                                                                                                                                                                      |                                                                                                                                                        |
| NSM: And we have places where vegetarian food is offered first, because it’s supposed to be available these days, if there’s space for it. And with certain foods, it might work here too, like putting the potatoes into a [smaller] dish ...                                                                                   | (1) Committing to development and expressing a professional perspective (reference to other schools)<br>(2) Ideating CV by limiting its implementation |
| Teacher1: They can’t reach to take it then                                                                                                                                                                                                                                                                                       | (1) Questioning the idea<br>(2) Professional perspective: difficult for children (Continues their previous speaking turn)                              |
| NSM: And then, you don’t have to choose whether to take this food                                                                                                                                                                                                                                                                | (Clarifies and agrees with NSM’s speaking turn)                                                                                                        |
| Teacher1: You can take everything                                                                                                                                                                                                                                                                                                | (1) Professional perspective (importance of increasing vegetable consumption)                                                                          |
| NSM: Because you should taste it. So when vegetarian food is freely available, you can take it with the other food and start tasting it. You can eat vegetarian food ... you don’t have to completely become a vegetarian, but when you increase the amount of vegetables in your diet, then you’ve already ... taken a big step | (2) (Indirectly) committing to development by limiting experiment’s goal                                                                               |
| Teacher X: It’s pretty ... easy to get a child to be eager about it, like ...                                                                                                                                                                                                                                                    | (Ideating and professional perspective)                                                                                                                |
| Facilitator: I’m sure order has a big impact, which comes first. Anything else? Did anyone else have questions, comments?                                                                                                                                                                                                        | The facilitator supports the experiment’s idea and indicates by asking for any other comments that the discussion on the topic is coming to an end     |

**Source(s):** Authors’ own work

Table 4. Turning point 4

| Speaking turn                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Interpretation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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| <p><i>Turning point 4: Leading role among professional groups in relation to CV changes</i></p> <p>NSM: [KS] returned to the team last week, and the next step is to talk to the central kitchen chefs about what kind of dishes we need to put there so that the other foods fit into the hot trays, because they can't be left out, as a large majority eats the basic food, and I doubt that I'll change significantly. We've done it at our largest school unit, at the Y school, for at least a year, we've placed the vegetarian food first, but unfortunately, the consumption of vegetarian food hasn't increased because of it. There's definitely an opportunity to try it here, but not with all foods. I don't see it working on the days that we offer meals made up of many options, but with soups and casseroles</p> <p>KS: Soups and casseroles</p> <p>Teacher1: But at least something</p> <p>NSM: Let's start experimenting with this, because the dishes we have don't fit into the transport cart –</p> <p>Teacher1: You see, it's just our dream, but in practice, it's easy to dream when you don't have to put everything into practice, because you're met by limitations</p> <p>NSM: If there was a long one-third section, like one-third, that was deep like this, but how do you pack it into the hot trolley that leaves, because it takes up space, what do you put alongside it, because it takes up so much of our capacity, and then there's an empty space in the vehicle transporting the food cubes through the city into a heated space, so it definitely has to be either – but there is the option that we could get some dishes like that here, and the kitchen manager would kind of –</p> <p>Teacher1: Tip them in</p> <p>NSM: – tip them in (-). Yes, but that goes against the self-monitoring rules</p> <p>Teacher1: Right, true</p> <p>NSM: Because then the food would cool down, and you can't just slosh it around back and forth too much. But when we start experimenting with the casseroles and soups, it won't be a problem. Let's see then</p> | <p>(1) Committing to development</p> <p>(2) Questioning and professional perspective (referring to experience and limiting the experiment by food type) 3) Ideating (soups and casseroles)</p> <p>Ideating (emphasizing NSM's idea of soupe and casseroles)</p> <p>Building collaboration: agreeing to limiting the implementation)</p> <p>(1) Ideating</p> <p>(2) Committing to development</p> <p>(3) Questioning and professional perspective (dishes and trolley)</p> <p>Building collaboration by diminishing one's own role or professional knowledge, persuading</p> <p>(1) Questioning and professional perspective</p> <p>(2) Ideating and alternative solution: KS could acquire new serving utensils</p> <p>Ideating an alternative solution</p> <p>(1) Questioning the solution offered</p> <p>(2) Professional perspective: self-monitoring rules of nutrition services</p> <p>Agrees</p> <p>(1) (continues explaining the self-monitoring rules)</p> <p>(2) Limited commitment to development (soups and casseroles)</p> <p>(continued)</p> |

Table 4. Continued

| Speaking turn                                                                                                                                                                                                                                                                                               | Interpretation                                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| Teacher1: And in principle, just trying it out with something and seeing –                                                                                                                                                                                                                                  | (1) Committing to development                               |
| NSM: Yes, certain foods                                                                                                                                                                                                                                                                                     | (2) Building collaboration: softening the goal of CV        |
| Teacher1: Because you can't increase your workload unreasonably either, because                                                                                                                                                                                                                             | Committing to limited development                           |
| NSM: But then again, considering our customers, when they're small, do they always understand why on some days the vegetarian food isn't in the first place, and then you have to explain that it's because of this or that. (---)                                                                          | Building collaboration: emphasizing the workload            |
| When the discussion continues, the facilitator takes part, partly ideating, partly making summarizing statements of the standardised process of nutrition services. NSM, KSM and the teacher ponder allergenics if pupils take vegetarian food on their own. Eventually the facilitator ends the discussion | (1) Questioning                                             |
| Source(s): Authors' own work                                                                                                                                                                                                                                                                                | (2) Professional perspective (from a new viewpoint: pupils) |

questioned the CV experiment on the basis of professional experience again by saying that the placement of the dishes on the line might not affect consumption. They also repeated all the obstacles caused by the current infrastructure: the dishes and transport trolleys making it difficult or impossible to implement the experiment. The NSM's expressions were somewhat internally dilemmatic. Speaking turns expressing both questioning and ideating occurred. The teacher, on the other hand, expressed building collaboration by showing their approval of the limitations and expressing empathy regarding the workload caused by the experimenting. The teachers' playful statement about CV being a 'their dream without considering practical restrictions' served to diminish their own role and was indirect acknowledgement of the professional knowledge of the nutrition professionals.

The discussion continued as the nutrition professionals and the teachers co-ideated implementation and alternative practices. The nutrition professionals also pondered the CV practices from the pupils' viewpoint (e.g. the risk of eating allergenic food); i.e. their questioning expressions contained a new kind of professional perspective. The teachers shared the concern and subtly questioned the implementation of CV. The facilitator eventually ended the discussion on CV and moved to discuss another experiment. [Table 4](#) shows two excerpts of this long discussion.

WS3 aimed to evaluate and further develop practices on the basis of the experiences of the experiments. Later in WS3, the facilitator stated that CV was the experiment that most needed further development. The NSM questioned this viewpoint, underlining the commitment to experimenting with "soups and casseroles" – i.e. the limited commitment continued. The facilitator reminded the participants about the unanswered questions on the implementation of CV and the practices that may be challenging for the pupils. They also took part in ideating by trying to find solutions. The CV experiment initiated by the teachers or its limited implementation initiated by the nutrition services was no longer questioned.

Eventually, everyone expressed their commitment to experimenting but within the limitations discussed. The participants agreed to inform all the teachers and to make information sheets to put on the food line. In between the speaking turns expressing commitment, the building of collaboration was expressed – now primarily in the form of direct questions about the division of tasks and responsibilities. At the end of the WS, the professionals, guided by the task given by the facilitators, praised and acknowledged each other. On the basis of the TP trajectory presented above, we now answer the research question.

### *5.2 Interpretation of the emergence of collective climate agency through the turning points*

The trajectory showed that both professional groups eventually committed to CV, but their agency in developing the experiment differed. CV was ideated by the teachers, who also used various expressions of building collaboration, such as indirect persuasion and emphasizing others' professional expertise, to sustain the CV idea. The agency of the nutrition professionals, especially the NSMs, emerged in WS2 and was largely built on questioning, which initially consisted of direct resistance of the idea of the experiment and the WS task that produced it, and later shifted to criticism of the implementation method of CV. However, the NSM's expressions changed during WS2 from questioning to ideating, i.e. trying to find alternatives to CV, and eventually committing to the experiment, but placing limitations on the options of implementing CV by referring to the current practices and equipment of nutrition services. The facilitators took care of the timetable and often returned the discussion to the WS script; they also participated in ideating and reminded the other participants of the unresolved details in the implementation of CV. The role of the teachers' expressions in building collaboration changed from softening and minimizing their own role

(WS2) to clear invitations to act and share the tasks initiated by the nutrition professionals (WS3). The role of professional perspectives in this case was to highlight the speaker's reasons for questioning or sometimes also ideation. The participants did not ask for the professional perspectives of other professionals.

Four turning points (TP) occurred in agency expressions. Through these, CV became a shared object for climate-related development – in this sense, a multiprofessional collective emerged that shared professional perspectives (Edwards, 2005; Engeström, 2015/1987). However, TPs raise the question of what kind of TA is involved from the perspective of CHAT and potential expansive learning: did the intervention address a motive conflict or the disturbances caused by a systemic contradiction (Sannino, 2022; Virkkunen, 2006)? We interpret that the NSM's expressions indicated a personally experienced motive conflict between their role as manager of nutrition services and the offered role as a co-developer in a multiprofessional intervention (Engeström and Sannino, 2011). The motive to collaborate with teachers clashed with their knowledge of the realities of nutrition services and their view of the effectiveness of CV formed from previous experience. This motive conflict emerged when the first attempts to resist (TP1) and then offer alternatives to CV (TP2) received no support. Thus, in TP3, CV became a shared object of development, but NSM expressed commitment by limiting the original idea. We claim that the later repetition of the limitation (TP4) by the NSM and the KS was an attempt to ensure consensus on the implementation of CV within the prevailing framework of the kitchen's operating model. Thus, TPs 3 and 4 led to the narrowing of the original experiment idea (Haapasaaari *et al.*, 2016; Scahill and Bligh, 2022).

Thus, the intervention, which began with only an intellectually understood motive (Virkkunen, 2006), brought a personal motive conflict to the surface (Sannino, 2022). However, it was not successfully facilitated by double stimulation to reveal a systemic contradiction. Consequently, what was criticized was the experiment's idea – not the structures of teaching or the nutrition services. The experiment was an innovation of the teaching activity, which became a disturbance to the current mass-production-style organization of school meals from the perspective of nutrition services (Engeström, 2015/1987). Thus, although the intervention involved collective agency, it did not lead to a qualitative change in the way the participants perceived their current work (Engeström, 2015/1987; Virkkunen and Newnham, 2013). The experiment was narrowed down to such a degree that it did not force them to go beyond their existing practices. In this sense, the intervention did not make TA lead to expansive learning (Virkkunen and Newnham, 2013).

We identify a few reasons for this. The facilitators were more oriented toward effectively conducting the concise intervention (Clottes Heikkilä and Kurki, 2024) and supporting the participants' joint experimenting than toward the rigorous analysis of prevailing practices. This was evident in the way in which the facilitators returned the discussion to the scripted task or suggested ideas for implementing the experiment. The teachers were skilled in building collaboration by using various speaking turns that diminished their own expertise (Weiste *et al.*, 2022) or empathized with the others' situation. Using these means, they played a part in facilitating the discussion (Clottes Heikkilä and Kurki, 2024; Virkkunen and Newnham, 2013). The teachers' expressions also reflected "knowing how to know who" (Edwards, 2005) in the intervention setting, as their implementation of CV depended on the nutrition service professionals. These expressions challenged the NSM to resolve the motive conflict through compromise rather than continuing to question CV. The participants may also have perceived the starting point of the intervention and thus their power to speak and contribute in different ways (Lindley and Lotz-Sisitka, 2019). It is noteworthy that the turning points occurred during a very short intervention, which had only three workshops.

The emergence of collective agency, and especially a new kind of understanding of the logic of the work activities, often takes more time (Sannino and Engeström, 2017; Spante *et al.*, 2022).

Together, these aspects formed an intervention in which a good atmosphere and a general need for the ethically and morally justified development of work overrode the manifestations of motive conflict in the speech, and thus the identification of a more systemic contradiction. Only through addressing questioning and explicitly working through motive conflict could school meals have been conceptualized and organized in a new way that would creatively combine the motives of education and the nutrition services, as well as overcome the contradictions of the activity. However, this would probably also have required expanding the intervention at the municipal level. Based on these interpretations, we argue that during this brief, intellectually understood developmental motive-based intervention, a multiprofessional, but not necessarily transformative, collective agency emerged.

## 6. Discussion

The need to mitigate and adapt to climate change is transforming the workplace, as it requires the ability to integrate professional expertise in novel ways (Edwards, 2005; Teperi *et al.*, 2025). Work communities could play an important role in climate action, as they present a type of local interest group (Moilanen and Alasoini, 2023; Thiele, 2016) between the more investigated levels of societal policymaking and the individual consumer. We explored how collective climate agency emerged through a brief DWR-based intervention (Engeström, 2015/1987; Virkkunen and Newnham, 2013) that was motivated by a moral-ethical understanding rather than a motive conflict or disturbances in participants' work (Sannino, 2022; Virkkunen, 2006). We analyzed the emergence of agency by applying a modified framework of TA expressions (Haapasaari *et al.*, 2016) and the concept of turning point (Haapasaari *et al.*, 2016; Scahill and Bligh, 2022).

During the intervention, the work community evolved into a multiprofessional collective with a shared climate-oriented object of development on a practical level. However, because the motive conflict that emerged during the intervention was not jointly analyzed in detail, the developmental experiment did not challenge the current practices and the logics of the work activities in question. The process was influenced by both the facilitators' orientation toward following the intervention's script (Clottes Heikkilä and Kurki, 2024) and supporting joint experimenting, and the participants' speaking turns aiming to build collaboration by persuading and downplaying their own role (Weiste *et al.*, 2022). Therefore, TA in the activity-theoretical sense of the term (Sannino, 2022; Virkkunen, 2006) – agency that has the potential to generate collective expansive learning (Engeström, 2015/1987) – did not emerge.

The results support those of previous studies showing that the formation of a collective agency and a new logic of activity that transcends systemic contradictions take time (Sannino and Engeström, 2017; Spante *et al.*, 2022). They underline the importance of the development phase of the activity (Sannino and Engeström, 2017) and the manifestation of motive conflict in the formation of collective TA. However, we argue that our results do not mean that the opportunity for collective climate agency is unnecessary if disturbances and motive conflicts have not yet exacerbated the situation at work. Rather, they reveal development challenges and opportunities for intervention methodology and facilitation.

DWR methodology has so far been developed to respond to complex societal challenges in multiactor settings. It aims to promote solutions by catalyzing local innovation and broader societal decision-making in parallel (Sannino and Engeström, 2018). Such interventions have already been carried out in different countries, in transdisciplinary development settings, for example (e.g. Lotz-Sisitka *et al.*, 2017; McClure *et al.*, 2023; Sannino and Engeström, 2018; Sannino *et al.*, 2018). However, because of the intensified pace of work, not all workplaces have the resources to participate in long processes (Mauno *et al.*, 2023). Climate change offers at least an intellectually understood motive (Virkkunen, 2006) for joint development through, for example, an internal sense of moral and ethical duty.

Our case suggests that an intervention focusing on experimentation that unites the professional groups of a workplace offer one way to bring motive conflict to the surface, even if the initial situation lacks strong push and pull for development (Sannino and Engeström, 2017). The questioning of the ideas and implementation of an experiment is not an obstacle to development – it generates TA (Haapasaari *et al.*, 2016; Sannino, 2022). Especially in brief interventions, facilitators should notice and have the courage to stop when questioning arises, and to guide participants toward even a rough historical analysis (Engeström, 2015/1987; Virkkunen and Newnham, 2013) of their work. Otherwise, a motive conflict and thus, a window into systemic contradiction, may be missed. The intervention may then rely on more randomly selected experiments instead of allowing the collective to create a new understanding of the activity, which would also make it easier to generate new solutions after the intervention.

The modified analytical frame contained *professional perspective* and *building collaboration* categories. Applying these raised the issue of the power dynamics and role expectations of the professional groups in the intervention. Collective climate agency does not consist of only critically ideating and experimenting climate-friendly practices. It also requires active incorporation of expertise and the building of collaboration (Edwards, 2005; Teperi *et al.*, 2025). These aspects have not so far been actively examined as expression categories in relation to the emergence of TA in DWR interventions. The power dynamics between professional groups should be considered when planning interventions, and the construction of the collaboration during process should be consciously examined (Haapasaari, 2020; Weiste *et al.*, 2022). The discussion may proceed in “good spirits and enthusiasm,” which may be taken as a sign of a successful intervention. However, a detailed analysis can show how different expressions minimizing one’s own competence or emphasizing the competence of another professional affect the progress of experiments (Weiste *et al.*, 2022).

Thus, even in brief interventions, development topics that participants can easily influence can be ideated (McClure *et al.*, 2023). However, climate change is a problem that cannot be addressed by development that maintains work activities’ familiar boundaries – new solutions that combine professional expertise are essential. Radical development requires not only the formation of a multiprofessional collective, but also collective TA that breaks the boundaries of current practices. We argue that such promotion of agency through brief processes is important to arouse motive conflicts that may ultimately encourage work communities to even transcend to the boundaries of organizations and hierarchies (cf. heterogeneous coalitions, Sannino and Engeström, 2018).

## 7. Limitations

Due to practical obstacles, the recorded data lacked the small group discussions in the WSs. The analysis focused on one of three experiments and on further developing analysis

methods to examine the formation of collective climate agency. In the future, it would be useful to examine all the experiments created in an intervention.

## 8. Conclusion

Multiprofessional work communities can play the important role of collective climate actors in the production of local solutions to a global challenge. This brief DWR-based intervention promoted experimentation and highlighted the importance of professional perspectives as well as building collaboration as part of climate actions. However, such brief processes require facilitators to be alert and responsive when questioning expressions arise. This enables reaching the core of motive conflict and systemic contradictions, and the creation of experiments that truly transform work into a more sustainable future.

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## References

- Ahonen, H., Virolainen, L. and Gardemeister, S. (2020), "Havahdu oppimaan alati kehkeytyvää – oppimisesta kompleksisessa työelämässä", In P. Vartiainen and H. Raisio (Eds), *Johtaminen Kompleksisessa Maailmassa*, Gaudeamus, Helsinki, pp. 229-245.
- Clottes Heikkilä, H. and Kurki, A.L. (2024), "Exploring virtual facilitation of co-development", *Journal of Workplace Learning*, Vol. 36 No. 9, pp. 37-52, doi: [10.1108/JWL-03-2024-0055](https://doi.org/10.1108/JWL-03-2024-0055).
- Edwards, A. (2005), "Relational agency: learning to be a resourceful practitioner", *International Journal of Educational Research*, Vol. 43 No. 3, pp. 168-182, doi: [10.1016/j.ijer.2006.06.010](https://doi.org/10.1016/j.ijer.2006.06.010).
- Engeström, Y. (2015), *Learning by Expanding: An Activity-Theoretical Approach to Developmental Research*, Cambridge University Press.
- Engeström, Y. and Sannino, A. (2011), "Discursive manifestations of contradictions in organizational change efforts: a methodological framework", *Journal of Organizational Change Management*, Vol. 24 No. 3, pp. 368-387, doi: [10.1108/095348111111132758](https://doi.org/10.1108/095348111111132758).
- Engeström, Y. and Sannino, A. (2021), "From mediated actions to heterogenous coalitions: four generations of activity-theoretical studies of work and learning", *Mind, Culture, and Activity*, Vol. 28 No. 1, pp. 4-23, doi: [10.1080/10749039.2020.1806328](https://doi.org/10.1080/10749039.2020.1806328).
- Haapasaari, A. (2020), "The hunters of lost parcels: an activity-theoretical study of the emergence and sustainability of workers' transformative agency", Doctoral dissertation, University of Helsinki.
- Haapasaari, A., Engeström, Y. and Kerosuo, H. (2016), "The emergence of learners' transformative agency in a change laboratory intervention", *Journal of Education and Work*, Vol. 29 No. 2, pp. 232-262, doi: [10.1080/13639080.2014.900168](https://doi.org/10.1080/13639080.2014.900168).
- Heikkilä, H. and Seppänen, L. (2014), "Examining developmental dialogue: the emergence of transformative agency", *Outlines. Critical Practice Studies*, Vol. 15 No. 2, pp. 5-30, doi: [10.7146/ocps.v15i2.16829](https://doi.org/10.7146/ocps.v15i2.16829).

- Lindley, D. and Lotz-Sisitka, H. (2019), "Expansive social learning, morphogenesis and reflexive action in an organization responding to wetland degradation", *Sustainability*, Vol. 11 No. 15, p. 4230, doi: [10.3390/su11154230](https://doi.org/10.3390/su11154230).
- Lotz-Sisitka, H., Mukute, M., Chikunda, C., Baloi, A. and Pesanayi, T. (2017), "Transgressing the norm: Transformative agency in community-based learning for sustainability in Southern african contexts", *International Review of Education*, Vol. 63 No. 6, pp. 897-914, doi: [10.1007/s11159-017-9689-3](https://doi.org/10.1007/s11159-017-9689-3).
- McClure, A., Patel, Z., Ziervogel, G. and Hardman, J. (2023), "Exploring the role of transdisciplinary learning for navigating climate risks in African cities: the case of Lusaka, Zambia", *Environmental Science and Policy*, Vol. 149, doi: [10.1016/j.envsci.2023.103571](https://doi.org/10.1016/j.envsci.2023.103571).
- Markrad, J., Raven, R. and Truffer, B. (2012), "Sustainability transitions: an emerging field of research and its prospects", *Research Policy*, Vol. 41 No. 6, pp. 955-967, doi: [10.1016/j.respol.2012.02.013](https://doi.org/10.1016/j.respol.2012.02.013).
- Mauno, S., Herttalampi, M., Minkkinen, J., Feldt, T. and Kubicek, B. (2023), "Is work intensification bad for employees? A review of outcomes for employees over the last two decades", *Work and Stress*, Vol. 37 No. 1, pp. 100-125, doi: [10.1080/02678373.2022.2080778](https://doi.org/10.1080/02678373.2022.2080778).
- Moilanen, F. and Alasoini, T. (2023), "Workers as actors at the micro-level of sustainability transitions: a systematic literature review", *Environmental Innovation and Societal Transitions*, Vol. 46, doi: [10.1016/j.eist.2022.100685](https://doi.org/10.1016/j.eist.2022.100685).
- Russell, S., Gioever, D. and Onkila, T. (2022), "Employee agency in the context of organisational sustainability", *Research Handbook of Sustainability Agency*, pp. 193-203.
- Sannino, A. (2022), "Transformative agency as warping: how collectives accomplish change amidst uncertainty", *Pedagogy, Culture and Society*, Vol. 30 No. 1, pp. 9-33, doi: [10.1080/14681366.2020.1805493](https://doi.org/10.1080/14681366.2020.1805493).
- Sannino, A. and Engeström, Y. (2017), "Co-generation of societally impactful knowledge in change laboratories", *Management Learning*, Vol. 48 No. 1, pp. 80-96, doi: [10.1177/135050761667128](https://doi.org/10.1177/135050761667128).
- Sannino, A. and Engeström, Y. (2018), "Cultural-historical activity theory: founding insights and new challenges", *Cultural-Historical Psychology*, Vol. 14 No. 3, pp. 43-56, doi: [10.17759/chp.2018140305](https://doi.org/10.17759/chp.2018140305).
- Sannino, A., Engeström, Y. and Lemos, M. (2018), "Formative interventions for expansive learning and transformative agency", In *Cultural-Historical Activity Theory Approaches to Design-Based Research*, Routledge, pp. 113-147.
- Scahill, J. and Bligh, B. (2022), *Developing Stakeholder Agency in Higher Education Sustainability Initiatives: insights from a Change Laboratory Research Intervention*, doi: [10.1002/9781119852858.ch6](https://doi.org/10.1002/9781119852858.ch6).
- Spante, M., Varga, A. and Carlsson, L. (2022), "Triggering sustainable professional agency: using change laboratory to tackle unequal access to educational success collectively", *Journal of Workplace Learning*, Vol. 34 No. 2, pp. 162-175, doi: [10.1108/JWL-02-2021-0019](https://doi.org/10.1108/JWL-02-2021-0019).
- Teperi, A.-M., Lyytimäki, J., Heikkilä, T., Malve-Ahlroth, S., Mervaala, E., Ratinen, I. and Thatcher, A. (2025), "What does it take to make a workplace just and green? – Systemic human factors approach", *European Journal of Workplace Innovation*, Vol. 9 Nos 1-2.
- Thiele, L.P. (2016), *Sustainability*, 2nd ed., Polity Press.
- Virkkunen, J. (2006), "Dilemmas in building shared transformative agency", *Activites*, Vol. 3 No. 1, doi: [10.4000/activites.1850](https://doi.org/10.4000/activites.1850).
- Virkkunen, J. and Newnham, D. (2013), *The Change Laboratory: A Tool for Collaborative Development of Work and Education*, Springer Science and Business Media.

Weaver, M., Cockburn, J., Mtati, N. and Palmer, C.G. (2023), "Exploring transformative processes at the intersections of land, water and livelihoods: a case study from the Tsitsa project, South Africa", *Ecosystems and People*, Vol. 19 No. 1, doi: [10.1080/26395916.2023.2278307](https://doi.org/10.1080/26395916.2023.2278307).

Weiste, E., Stevanovic, M. and Uusitalo, L.L. (2022), "Experiential expertise in the co-development of social and health-care services: self-promotion and self-dismissal as interactional strategies", *Sociology of Health and Illness*, Vol. 44 Nos 4-5, pp. 764-780, doi: [10.1111/1467-9566.13457](https://doi.org/10.1111/1467-9566.13457).

Wittmayer, J.M., Avelino, F., van Steenberg, F. and Loorbach, D. (2017), "Actor roles in transition: insights from sociological perspectives", *Environmental Innovation and Societal Transitions*, Vol. 24, pp. 45-56, doi: [10.1016/j.eist.2016.10.003](https://doi.org/10.1016/j.eist.2016.10.003).

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