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Generating transformative agency among horticultural producers: An activity-theoretical approach to transforming Integrated Pest Management

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ABSTRACT

This study presents a systemic innovation in the context of Integrated Pest Management – IPM. We introduce the Change Laboratory method as a tool for transforming pest management in a community of greenhouse firms that are interdependent through a shared pest. The objective of the study was to see if the Change Laboratory method, based on an activity theoretical and expansive learning approach, is appropriate for promoting the agency among greenhouse growers so that they become transformative agents of their own activity. The study is based on deductive and inductive content analysis of transcribed discourse data from six Change Laboratory sessions. By analyzing how expressions of transformative agency and its different forms of expression unfolded over the sessions, we showed that criticizing was the most important agentive talk that fed the reconceptualization of the current, problematic activity. The analysis of the envisioning expressions of transformative agency indicated a collectively produced reconstruction (re-design) of the object of IPM activity, i.e. a radical change, in activity-theoretical terms, in the activity of whitefly IPM. As a result of the process, the growers began knowledge sharing and collaborative learning in two villages of the study area, using a learning club as the platform. In contrast to traditional views of externally induced change, the agentive actions were performed by the growers themselves instead of external change agents. Being able to identify the discursive transformative agency actions in the talk of farmers can improve the capability of interventionists to support transformative change when implementing IPM through co-innovation. We propose that revealing the object of farmers' and other stakeholders' pest management activity through analysis of transformative agency actions during formative interventions could contribute to better understanding what it takes to implement IPM in 'local conditions'. This study provided us an opportunity to contrast and compare the activity-theory-based approach to facilitated change with other social learning approaches to change, with their specific system concepts, in the domain of natural resource management.

1. Introduction

The EU framework directive 128/2009/EC on the sustainable use of pesticides emphasizes that integrated pest management (IPM) shall be used by all crop producers from 2014 onwards (European Union, 2009). This top-down initiative needs to be transformed into a bottom-up co-innovation process through which agricultural producers transform their pest management approaches (e.g. (Wijnands et al., 2014). Co-innovation denotes reconfiguration of relational, institutional and organizational patterns and arrangements, learning processes, and information flows among stakeholders working towards a common purpose (Klerkx and Nettle, 2013; Maniak and Midler, 2008) with the direct involvement of farmers in all stages of the innovation process to ensure relevance, applicability and adoption (Dogliotti et al., 2013; Peshin and Dhawan, 2009).

Recent studies suggest that new types of agency are needed to produce and implement radical co-innovations (Courvisanos, 2007; Geels, 2004; Klerkx et al., 2010a, 2010b). We argue that the implementation of co-innovations requires transformative agency, a future-oriented creative potential for generating intentional change in human activity (Blackler and Regan, 2009; Caldwell, 2005). Transformative agency is the capacity to form and implement intentions that go beyond and transform the accepted routines and given conditions of an activity (Engeström and Sannino, 2013). It is increasingly understood as distributed, dispersed, and decentralized among multiple actors in organizations and communities (Buchanan et al., 2007; Meyer and Jepperson, 2000). It is also distributed in time, taking shape in often lengthy processes of learning, design, and implementation.

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Agency is traditionally understood as the ability to take intentional action and make a difference over a course of events (Giddens, 1984), or the capacity of an individual to initiate and maintain a program of action independently of the constraining power of social structures (Burton and Wilson, 2006; Campbell, 2009). No single actor has sufficient power and resources to pursue his or her innovation goals without taking into account and coordinating with other actors (Aarts et al., 2007; Klerkx and Aarts, 2013; Caldwell, 2005). Recently, therefore, the emphasis of agency for innovation production has shifted from individual to collective and distributed agency (Blackler and Regan, 2009; Buchanan et al, 2007; Caldwell, 2005; Garud and Karnøe, 2003; Lockie, 2004; Pelenc et al, 2013; Whittle et al., 2011). The emergence of transformative agency, a collective process in nature, is a particularly demanding learning challenge in contexts where the practitioners have been socialized into modes of thinking and acting that emphasize individualism and private property, possibly at the expense of collaboration and joint responsibility. In natural resource management, social learning has become a leading concept for fostering innovation and managing change (Blackmore, 2007; Loeber et al., 2007; Pahl-Wostl et al., 2008). Social learning refers to the construction of shared mental models among the individuals involved so that the ensuing change becomes situated within wider social units, whereupon learning occurs through social interactions and processes between actors within a social network (Bos et al., 2013; Reed et al., 2010; Scholz et al., 2013). Horticultural enterpreneur-producers may be expected to exemplify this pattern. As pests do not respect the geographical and legal boundaries between individual producers, successful implementation of IPM requires new levels of collaboration among producers located in the same geographical area and being interdependent through pest movement between firms (Yu and Leung, 2006).

Relatively little is known about how transformative agency emerges and unfolds during the innovation process and whether general patterns in its unfolding can be expected (Haapasaari et al., 2014). In particular, the emergence of transformative agency in a predominantly individualist context is a poorly understood issue. In this paper, we show how a formative intervention method called Change Laboratory (Virkkunen and Newnham, 2013) was used to induce transformation of IPM in horticulture by specifically supporting the transformative agency of greenhouse growers in a facilitated learning process. The intervention method combines bottom-up and top-down approaches and is therefore particularly suitable for turning top-down initiatives into locally focused and motivated innovation processes. Our study applies cultural-historical activity theory (CHAT) to explore two questions: (1) what type of transformative agency actions can be expected to happen when agency increases among actors in facilitated innovation processes? (2) what it takes to make people the owners of their own innovations and the development of their productive activity?

This article may be seen as a first step to bring together two approaches to system learning and collective agency: the approach to system learning and learning systems in agriculture and natural resources management initiated by Röling and colleagues (Leeuwis and Pyburn, 2002), and the later appliers of this social learning approach (e.g. Pahl-Wostl, 2009), and the CHAT-based theory of expansive learning and methodology of formative interventions, advocated by Engeström and his colleagues (Engeström and Sannino, 2010). The article contributes to the debate on social learning and co-innovation by means of examining the process of collective agency creation within a formative intervention aimed at systemic change. The case of regional IPM is particularly interesting because it is an example of a problem that requires collective construction of a system-level innovation crossing organizational boundaries. In this study, pest management activity, with whiteflies as the focal pest, was the central activity that was analyzed and transformed in the context of greenhouse vegetable production, with greenhouse entrepreneurs as the key subjects.

In the next section, we will present the theoretical and methodological background underpinning the Change Laboratory method (Section 2.1), and introduce the conceptual framework for identifying discursive expressions of transformative agency (2.2). We then proceed by describing the setting and the process of the intervention (3.1) and our data and methods (3.2). The results are presented first as an overview (4.1), then as the evolution of specific expressions of transformative agency during the intervention (4.2), and then in terms of distribution of expressions of transformative agency among the participants. Finally, we will discuss our findings (5) and draw conclusions on the value of our research findings to the research on collective agency and social and system learning (6).

2. Supporting transformative agency through the Change Laboratory

2.1. Change laboratory for supporting transformative agency

Pelenc et al. (2013, p. 87) point out that "collective agency cannot be imposed; it has to emerge through a learning process based on interactions between people." In this study, we argue that transformative agency requires a specific type of learning, namely expansive learning. It refers to a process in which the object and motive of a human activity are qualitatively transformed in a sustained effort to resolve contradictions in the activity (Engeström and Sannino, 2010).

In CHAT, the theoretical unit of analysis for understanding and explaining human practices is a historically developing activity system (Engeström, 1987; Fig. 1), which is oriented towards the transformation of an object and mediated by culturally artifacts that serve as instruments for a purposeful activity (Gillespie and Zittoun, 2010). When an activity system is taken as the unit of analysis, there is no individual subject without the social context, and no social context without individual subjects (Engeström, 1999a). Although actions are conducted by individuals, these actions make use of artifacts that are originally social and historical. The subjects become agents thanks to the power given by cultural artifacts (Vygotsky, 1987). By way of example, the structure of the sub-activity of pest management within the main activity of tomato production is summarized in Table 1.

Qualitative change and development of an activity take place in expansive cycles driven by contradictions. Contradictions function as sources of development by triggering specific agentive actions of questioning and intentionally breaking away from the constraints of the existing activity (Engeström and Sannino, 2010). An expansive cycle denotes a process to a qualitatively changed activity system with an expanded object. The ideal-typical succession of the learning steps is depicted in Fig. 2, but it must be noted that in practice the process proceeds iteratively (Engeström et al., 2013).

Change Laboratory interventions are aimed at purposefully facilitating expansive learning and transformative agency (Virkkunen and Newnham, 2013). Throughout the intervention, participants are

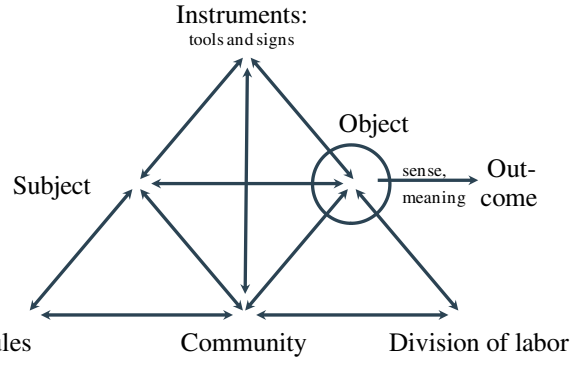

Fig. 1. A general model of an activity system with its six main functional elements, featuring the relationships between object-oriented activity, actors (subject) and the community of which they are a part, and the mediating elements (tools, rules and division of labor) between the key elements (Engeström, 1987).