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Unlearning towards an uncertain future: on the back end of future-driven unlearning

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Abstract

Purpose – While many approaches in the field of unlearning aim at describing, understanding or explaining the "what" and/or "how" of unlearning, this paper aims to focus on the "where-to" and the goal of unlearning. In many cases, unlearning starts off with a specific result or goal in mind. This paper suggests that such an approach has to be challenged in the context of a highly complex and uncertain world and to introduce a mode of unlearning following a strategy of future-oriented open-endedness.

Design/methodology/approach – This conceptual paper draws on (both theoretical/philosophical and empirical) interdisciplinary evidence from a wide variety of fields, such as organization studies, organizational (un)learning, systems theory, cognitive science and innovation studies.

Findings – It turns out that open-endedness in unlearning processes plays a central role, especially if we are confronted with high levels of uncertainty and complexity. In such an environment, following a strategy of co-becoming with an unfolding environment and with an emergent goal seems to be more promising than aiming at a preconceived (un-)learning goal.

Originality/value – The unlearning literature provides various approaches to what unlearning is and how it can be executed. However, understanding the actual goals and outcomes of unlearning and how these goals are identified and determined is a rather under-researched field. In many cases, they are preconceived in advance finding their realization in new forms of knowledge, assumptions, belief systems, values or routines. This paper challenges this strategy and addresses the gap of how it is possible to unlearn toward an uncertain future. This has an impact on the process of unlearning itself; it has to be reframed and understood as an open-ended strategy for identifying emerging future potentials, purposes and goals in a process of co-becoming with an unfolding future.

Keywords Innovation, Unlearning, Co-becoming, Future-orientedness, Non-action, Novelty, non-action, Open-endedness, (overcoming) problem solving, Uncertainty, Unknown, Unpredictability, Problem-solving

Paper type Conceptual paper

1. Introduction and motivation

While processes, routines, as well as rule- and knowledge systems reign large parts of our economy and, more specifically, our organizations and businesses, these organizations are permanently facing exogenous change, high levels of uncertainty and volatility and

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disruption. As an implication, one of their major challenges is to find a good balance between organizational stability and change (Chia and King, 1998; Fiol and O'Connor, 2017; Tsoukas and Chia, 2002). Unlearning is situated at this interface between stability and change (Fiol and O'Connor, 2017) and – as a result of loosening stability – it opens up a space for novel (knowledge) structures, processes, mindsets or routines.

The focus of this paper lies on the latter point: we are not primarily interested in the initiation, in how to launch and perform processes of unlearning, but in the *final cause*, the *goal(s)* and the *very purpose of unlearning*. The guiding question driving this paper is: Why are we unlearning and, more specifically, "where-to" are we unlearning? We are referring to this phase of unlearning as the *back end* of unlearning[1].

(Deliberate) unlearning "involves a process of consciously choosing to abandon or give up particular knowledge, values, or behaviors" (Hislop *et al.*, 2014, p. 541f). If unlearning is not only understood in the sense of forgetting or abandoning knowledge (Becker, 2018), we are immediately facing the question how (and if) new goals (Lindner and Foss, 2018) can be identified toward which the unlearning process should be directed to. In most cases, there will be an intention why an organization wants to engage in an unlearning process as unlearning requires an extra effort of breaking up existing patterns or routines (Grisold and Kaiser, 2017, p. 41). As, for instance, Becker (2018) shows unlearning oftentimes is applied to facilitate innovation processes by reducing inhibitors and enabling to bring forth novel knowledge or routines. Furthermore, Becker understands unlearning as an enabler not only for leaving behind obsolete knowledge, but also for acquiring new knowledge and behaviors as a foundation for organizational change. Klammer and Gueldenberg (2019) give some examples of where unlearning processes could be directed to, such as in mergers and acquisition processes or in strategically optimizing the knowledge stock.

The answer concerning the goal or intention of unlearning is crucial, as it has an impact on how the unlearning process itself is set up. However, there is relatively little literature on how new goals are identified in unlearning processes and their implications on the unlearning process itself. In some cases, they are initiated with a specific preconceived goal in mind (Becker, 2018), be it new knowledge, mindsets or values, routines or behaviors. As is shown by Lindner and Foss (2018), for goal formation, it is necessary to take into consideration (microfoundational) "internal goals" (e.g. set by top managers, sales revenues, production, market share goals, etc.) and external changes (e.g. new technologies, competitors, etc.). The challenge is to relate these internal and external goals/changes. This paper argues that, for the proposed form of unlearning, goal formation is not only about these challenges, or goal congruence, conflicting interests, etc. (Lindner and Foss, 2018, p. 47f), but also about including the perspective of emerging future potentials.

This paper:

- suggests to challenge this approach of starting a process of unlearning with a predetermined goal; and
- develops a future-oriented mode of unlearning.

Being confronted with a world that is characterized by a high levels of uncertainty, ambiguity, complexity and unpredictability, such a strategy of preconceived goals seems to be at least questionable, although it is clear that there are limitations and not infinite possibilities (Lindner and Foss, 2018). As a consequence, the process of unlearning itself has to be rethought and reframed as a strategy for identifying emerging future potentials, purposes and goals in a process of co-becoming with an unfolding future. This paper addresses the gap of how it is possible to unlearn toward a future that is open-ended and unfolding in uncertainty and unpredictability.

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2. Unlearning in a volatile, uncertain, complex and ambiguous world – theoretical foundations

2.1 Unlearning as abandoning non-functional knowledge and behaviors

Since Hedberg (1981) introduced the concept of unlearning originally describing it as abandoning old and non-functional routines, knowledge, behavior or, more generally, of patterns to make room for new ones, the focus was on how these old patterns hinder establishing new behaviors (Becker, 2018; Fiol and O'Connor, 2017; Klammer and Gueldenberg, 2019). Hislop *et al.* (2014) consider unlearning as paramount, "as the inability to give up or abandon knowledge, values, beliefs, and/or practices can produce a rigidity in thinking and acting limiting a person's or organization's adaptability" (Hislop *et al.*, 2014, p. 541). This leads Becker (Becker, 2018, p. 113) to the conclusion that for unlearning to be successful, it is necessary both for individuals and organizations to enter into a process of reframing (Schein, 1993), of reflecting and questioning their mental models (Johnson-Laird, 2004), frames of reference, behaviors and routines, and of letting go of them. In most cases, this introduces a state of (organizational and personal) instability, leading sometimes to resistance.

Apart from the anxiety that is induced when being in a state of instability or being confronted with uncertainty in general (Hartner-Tiefenthaler *et al.*, 2018), this resistance has its roots in not being able to deal with not knowing and understanding where the unlearning process might lead to. This applies especially in the context of a "forgetting-like" unlearning process (Becker, 2018, p. 108) or, more importantly, in processes of deep unlearning. The latter is an experience of *transformative unlearning* and involves questioning and sometimes giving up one's deep (organizational) mental models, beliefs or value systems. Such a process "is deeply emotional and challenging for people to undertake [. . .] the catalyst for transformative unlearning is a process of change that brings a person's preexisting values, assumptions, knowledge and practices into question" (Hislop *et al.*, 2014, p. 554ff). In any case, it is about:

- understanding that parts of the existing knowledge, values, beliefs or behaviors are not adequate any longer; and
- thus, they have to be abandoned, and, in some cases, have to be replaced by new ones.

More generally, most of the discussions in unlearning revolve around the following issues and questions:

- Individuals as well as organizations are not "blank slates"; their perception, thinking and behaving is determined by existing knowledge and past experiences. This phenomenon has its roots in what cognitive science and neuroscience refer to as the *predictive mind hypothesis* (Clark, 2016; Hohwy, 2013) stating that cognitive systems are "prediction machines" using past experiences to make sense of novel phenomena. In the organizational context, this is referred to as the "Organizational Predictive Mind" (Grisold and Peschl, 2017a, 2017b). In some cases, this may result in blind spots and, therefore, "may hinder future efforts to learn or acquire knowledge" (Becker, 2018, p. 105f).
- What should be unlearned? Here the discussion circles around the issue of identifying, eliminating and discarding existing, outdated or non-functional knowledge, behaviors or routines.
- How can we break up and leave behind these patterns of perception, action and thinking that are determined by the past?
- And, finally, finding a good balance between old and new knowledge. How much novelty should we allow and how much of the old knowledge should we retain (Hislop *et al.*, 2014; Klammer and Gueldenberg, 2019)?

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2.2 Are our brains capable of unlearning?

Before going into more specific approaches in unlearning, let us have a short look at the question of whether our brains (or organizations) are capable of unlearning and creating new knowledge at all. This question has a long tradition in the fields of creativity and innovation research (Amabile, 1996; Hennessey and Amabile, 2010; Mumford, 2012; Tidd and Bessant, 2009). Our experience as well as large parts of our culture, art, science or technology (or, more generally, of our designed cultural worlds) provide clear evidence that humans are highly creative creatures capable of continuously bringing forth new knowledge in the form of novel artifacts and practices (Krippendorff, 2011; Risto, 2011). This stands in contrast to the claims of the predictive mind hypothesis (Clark, 2016; Hohwy, 2013) having been discussed above.

Clark (2018) suggests to take a closer look at our interaction with the designed environment for solving this puzzle. His point is that our designed artifact environment acts as a potential source of novelty. It provides constant irritations for the error-minimization and prediction activities of our brains (and organizations) and, by that, disrupts the prediction equilibrium.

This calls for developing novel knowledge and strategies that are capable of dealing with these irritations or changes in the environment. Such an approach is based on the assumption that our cognition is not restricted to our brains, but extends out into the world (cf. extended approach to cognition; Clark and Chalmers, 1998; Menary, 2010; Rowlands, 2010). In short, by interacting with our environment, new opportunities and niches are created that, in turn, may change our cognition and vice versa. These interactions are responsible for bringing forth novel knowledge, interaction patterns and/or environmental structures. The goal is to create enabling infrastructures, which we refer to as enabling spaces (Peschl and Fundneider, 2014a, 2014b). In the context of unlearning, this means that organizations have to provide spaces (in the more general sense of opportunities, affordances, processes, office spaces settings, etc.), enabling these irritations, such as reflection, creative settings, organizational settings for identifying obsolete knowledge, etc. "Such practices [. . .] repeatedly push us away from local equilibria, ensuring a steady diet of change, innovation, and challenge. Indeed, we may expect complex ratcheting effects here as altered environments install policies that drive the creation of further altered environments" (Clark, 2018, p. 10f).

2.3 Unlearning in an uncertain environment

While our brains have difficulties with dealing with novelty, we are living in an environment that is characterized by high levels of volatility, uncertainty, complexity and ambiguity ("VUCA world"; Bennett and Lemoine, 2014). In such contexts, it is pivotal for an organization to have the capacities to cope with these uncertainties. If unlearning is understood as an open-ended activity, this directs our attention toward these uncertainties of yet untapped and to be anticipated opportunities lying in the future. Sarasvathy *et al.* (2003, p. 144) have developed three types of uncertainties:

(1) In the simplest form of uncertainty, both the problem space and the solution space are known in advance (Dorst, 2003; Simon, 1996). The challenge is to solve a given (organizational) problem as quickly and inexpensively as possible. In the context of unlearning this means that one tries to direct unlearning toward fixing a known problem by selecting the optimal known solution and making use of the unlearning process to reach this solution. Unlearning is understood as enabling *problem-solving* or *optimizing*.

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(2) In this form of uncertainty, the problem space and the solution space do exist, but the solution space is *not known* in advance. This means that the solution space has to be explored in the process of unlearning to discover possible adequate solutions (e.g. by trial and error or prototyping). Hence, unlearning can be seen as enabling the *discovery* of a solution.

(3) Lastly, Sarasvathy *et al.* (2003) identify a form of uncertainty that is about a future that is not only unknown, but also unknowable. Neither the problem nor the solution space are known (well) in advance; rather, due to the highly dynamic (organizationally) internal and external environment, they are constantly changing. As a consequence, this notion of uncertainty has to do with the creation of new opportunities or new niches and environments. As the problem space and the solution space are changing permanently, they have to be brought into being in a process of mutual co-creation and interaction with the environment and stakeholders, as the telos/goal is not known in advance. This form of uncertainty requires a process of unlearning as enabling the *creation* of a solution/niche or new opportunity.

For the context of this paper, this third form of uncertainty is in the focus of our attention. It is not only the most interesting and challenging, but also reflects best the situation with which most organizations are confronted today. Facing a VUCA world, organizations find themselves always in a polarity and tension between stability and change. While routines or processes support stability, unlearning can act as a point of departure, enabling change, learning and innovation. Let us take a look at forms of unlearning dealing with these issues.

2.4 Unlearning as reducing the influence of old knowledge

Hislop *et al.* (2014) suggest to understand unlearning not only as a process of consciously giving up knowledge or behaviors, but to keep in mind that "this abandoned knowledge is not permanently lost but is consciously discarded and remains retrievable for future use" (Hislop *et al.*, 2014, p. 556). This brings us back to the following issues: what is the influence of old knowledge, what is meant by "future use" and most importantly, where do the (future) goals of unlearning come from or, more generally, are they necessary at all from the outset? What are the implications for the design of the unlearning process?

Grisold *et al.* (2017) summarize this approach in a compelling manner and understand unlearning as "a process where subjects reduce the influence of old knowledge for the sake of creating new knowledge and/or patterns of thinking. [. . .] unlearning can be seen as a reduction of existing knowledge while creating new knowledge" (Grisold *et al.*, 2017, p. 4617). Reducing the influence of past experiences leads to less biased patterns and opens the space for novelty, for creating new knowledge and finally, for new behaviors, routines and innovations.

2.5 Shifting the focus toward the back end of unlearning

Nevertheless, we are still confronted with the question where this "new knowledge" comes from, where should unlearning be directed to and what could be the source of these new behaviors or routines. As Becker (2018) states, "Behavioural unlearning typically refers to individuals letting go of past practices or behaviours in order to adopt new ways of working" (Becker, 2018, p. 113). What are these "new ways of working," where do they come from? While most approaches in the field of unlearning aim at describing, understanding or explaining the "what" and/or "how" of unlearning, we want to focus on the "where-to," the final cause, or the purpose and goal of unlearning. As is shown by Hislop *et al.* (2014)

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literature review, most approaches to unlearning focus on antecedents (the front end) and processes of unlearning, and only a few focus on the consequences (the back end) of unlearning. The remainder of this paper focuses on this aspect of unlearning. In most cases, it is only clear that we have to "unlearn," forget, break existing cognitive, organizational or behavioral patterns; however, it is far from clear if they should be replaced, and what these new patterns or knowledge should look like. This is the point where *unlearning* and *innovation* intersect and unlearning gets in touch (or in resonance) with an unfolding future.

What is clear so far is that unlearning brings about an understanding of learning that is not primarily based on discarding and accumulating knowledge. Rather, it is an *adaptive process* where old and new knowledge interact with each other in a process of mutual fade-out and fade-in. (Un-)Learning is a gradual shift from old patterns of perception and thinking to adopting/adapting to, cooperating and co-creating successfully with an unfolding (uncertain) future.

Understood in this way, unlearning is no longer a process of *problem-solving*. However, most classical unlearning processes are approached as a problem-solving exercise: Unlearning is supposed to solve an identified (organizational) problem. As we have seen above, however, problem-solving does not suffice in a highly uncertain environment. Neither problem- nor solution space are known in advance; rather, both are "moving targets," as they are changing permanently (Sarasvathy *et al.*, 2003; Dorst, 2003).

In such a context, the nature of unlearning changes as well: it is about *becoming sensitive for what wants to emerge* (as a future potential) and how it is possible to shape reality (e.g. the organization) in such a way that it becomes beneficial both for the user and the organization. Hence, it is necessary to apply a completely new set of methods, skills, mindsets as well as strategies for dealing with these challenges. Although they mainly concern the back end of unlearning, they have a direct impact on the unlearning process itself. In the following sections, we will develop a deeper understanding of such an open-ended and future-oriented approach to unlearning.

3. Unlearning toward an uncertain and unknown future

3.1 Non-action and embracing the unknown

If an organization or an individual is confronted with a novel, unexpected or difficult situation, it is a natural reaction of our cognitive processes to immediately engage in a process of searching for solutions and possibilities of how to deal with this unknown phenomenon, how to "solve" this problem. In many cases this leads – via an unlearning process – to a behavioral action aiming at eliminating this irritation. This is due to the predictive mind dynamics (Clark, 2016; Hohwy, 2013) having been discussed above. Past experiences are applied to "solve" this problem. In many cases, this unlearning process aims at destabilization, searching for desired and given solutions and subsequent actions to bring the novel situation under *control*.

Alternatively, we propose to *not* immediately enter into a mode of doing, (re-)action or taking control, but rather to *suspend* our thinking and habitual patterns. Instead of downloading past experiences (Scharmer, 2007) or engaging in an active process of unlearning and reacting, we propose to enter into a mode of "non-action," listening and observing. Suspending by listening not only to the environment and to others, but also to oneself is essential for exploring new possibilities (Scharmer, 2007).

Hence, we challenge the dominant view of unlearning as an active process of discarding obsolete knowledge to replace it by "new" or preconceived knowledge. Rather we suggest to change perspective and focus on the aspect of appreciating that unlearning – in a process of destabilization – opens up a space of yet unknown and new opportunities calling for a

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mindset of "non-action" (Brook *et al.*, 2016) or "inaction" (Vince, 2008) and of being receptive. Vince (2008) brings to the fore the importance of inaction in the sense of providing space for *reflection* and *openness*. In other words, inaction as opposed to the imperative of having to act unceasingly is the "collective's ability to reflect and to (re)enact organizational limitations" (Vince, 2008, p. 100). To avoid such an unintentional inaction resulting from pursuing action for its own sake, what we are calling for here is a kind of "productive and reflective inaction" as a starting point for unlearning.

Or, as Brook *et al.* (2016) suggest, "non-action [. . .] is a capacity enabling self-restraint and the deliberate limiting of actions. In the context of intractable or wicked problems, where any given action might lead to unexpected outcomes, unlearning leading to conscious non-action might create the space for new questions and possibilities" (Brook *et al.*, 2016, p. 370). In our highly non-linear environments, it is not only almost impossible to predict the future dynamics, but also not to anticipate the consequences of our own preconceived interventions.

Thus, being in a state of ignorance of "not-knowing-how-to," suspension as well as of reflection could bring about *radical openness* to what wants to emerge. It enables the capacity of taking new perspectives, changing our patterns of perception as well as asking new questions that might open up completely new problem/knowledge/behavioral spaces. "Deliberate non-action, whilst apparently passive, is an actually considered position of not taking action now in order to remain open to the emergence of other possibilities [. . .]. This deliberate refraining from action can be powerful rather than powerless, especially in retaining a freedom for future action" (Brook *et al.*, 2016, p. 382). In this context, the concept of the "organization of emptiness" (Hsu, 2013, p. 367) introduces the interesting aspect of non-action on the sense of reducing unnecessary ((un-)learning) activities and of reducing the level of control and of using knowledge for instrumental purposes only.

Instead of planning to terminate in a predefined changed organizational state, non-action leads to an *open-ended* condition that is attracted by a potential future state. The (un-)learning goal evolves and emerges in the course of inaction and letting go and in a subsequent process of co-becoming with the environment. In the sections to come, we will focus on the consequences of such a non-action approach for an open-ended and future-oriented form of unlearning.

3.2 Reversing agency: the importance of the role of an unfolding reality

First of all, we have to acknowledge that the *environment* (be it the organization, user and his/her needs, market, etc.) plays a crucial role in such a perspective of unlearning. It is *not* primarily the creative and innovative mind of an individual leader or of a group of individuals that initiate a process of unlearning with a specific and preconceived goal in mind. Rather, we suggest to give up the idea of having a clearly defined goal or purpose for the change process before starting to intervene in the environment. Hence, we are facing the issue of how to identify this (new) purpose and what are "adequate" goals worth pursuing so that a successful and thriving process of unlearning and change might emerge.

In other words, the challenge is to develop strategies avoiding that the resulting novelty or innovation is neither driven by past experiences nor completely arbitrary (like in many "out-of-the-box thinking," creative or brainstorming processes) (Mumford, 2012; Paulus *et al.*, 2002). Furthermore, the desired goal should not only be set by the senior management or by classical economic parameters (Lindner and Foss, 2018). It is obvious that the goal cannot be completely open with respect to organizational and economic constraints;

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however, it has to be clear as well that these cannot be the only determining factors, and that they have to be integrated with other components.

Besides creative ideas and economic constraints, a desired goal should fulfill a deeper purpose that is coherent with emergent organizational and environmental potentials, dynamics and needs. This implies a "reversal of agency": unfolding reality and environmental potentials take the role of driving the process of unlearning instead of a preconceived plan or change goal. In this sense, such an approach to unlearning has something to do with *giving up control*.

Hence, the goal is to engage in a process of *co-becoming with an unfolding future* (Ingold, 2013; Peschl, 2018a, 2018b; Roth *et al.*, 2016). It is a process of co-creating a future by "learning from the future, as it emerges" (compare, for instance, Scharmer (2007, p. 52)). It is about getting in resonance and correspondence with future potentials and bringing forth novelty and innovation as an *emergent* result of the unlearning process. However, it is neither meant to be a process of problem-solving (Dorst, 2003) nor a kind of "creative thinking" or brainstorming exercise.

3.3 Future potentials and the "not-yet"

What are the theoretical underpinnings of such an approach to open-ended or emergent unlearning? To engage in such a process of unlearning, the persons involved (or leading this process) have to have a profound and intimate knowledge (compare the concept of "knowing from within" (Bortoft, 1996; Depraz *et al.*, 2003; Ingold, 2013; Peschl and Fundneider, 2013) about the organization, its environment as well as the ecosystem it is embedded in. By making use of this knowledge, they try to identify hidden future potentials (i.e. what wants to emerge, what is "not yet" (Bloch, 1986)), make sense of them and bring them into the present to develop and incubate them into concrete (novel) change (artifacts), knowledge, behaviors, etc. These future potentials inform and partly lead the unlearning process.

Hence, novelty or new knowledge is not so much a projection or extrapolation of our own ("out-of-the-box") ideas or past experiences (Grisold and Peschl, 2017b) into the future, but the *future potentials* are "teaching" and *attracting* us (in the sense of final cause or emerging purpose). By that, future is co-created in a process of joining, making use of future potentials and uncertainty and shaping the (unlearning) process by an unfolding reality. Ontologically speaking, this "unfolding of an uncertain future" and the notion of potentials can be understood in the following manner: any phenomenon, entity, system or object is unfolding its own behavioral dynamics/becoming according to its inner workings and its interactions with the environment over time. This means that every phenomenon or object is not completely determined or "complete" in its dynamics (in the sense of not being completely predictable and not having reached its final state). This perspective has its roots in, for instance, Aristotle (1991) metaphysics and draws on the concepts of *potentia/potentiality* (what is not yet) and *actus/actuality* (that, what is more or less fully developed or complete) or, as Kauffman (2014, p. 4ff) refers to them, *(adjacent) possibles/res potentia* and *actuals/res extensa*; contrary to actuals, possibles are open to develop in various ways and directions that are partially intrinsic to this phenomenon/object and partially dependent on environmental stimuli, influences or changes. In this context, Poli (2006) introduces the concept of *latents* and potentials: latents do not exist yet in the actual state and have to be brought forth (Poli, 2006, p. 77f). Hence, unlearning is not only about identifying obsolete knowledge, values or routines, but about opening up to these future potentials.

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In this sense, we are developing or *co-becoming together with the (partly) unknown and uncertain future* (Ingold, 2013; Peschl, 2018a; Roth *et al.*, 2016). The (future) goal, purpose or final cause of unlearning *emerges* in a process of interacting and corresponding to/with the environment. "Aristotle saw chance as introducing an 'as if' teleology, which is present if a goal is reached, although there was no intention to reach it as such" (Mitleton-Kelly, 2007, p. 113).

The interesting and challenging points are to:

- switch into a mode of non-action and listening to which potentials are there and want to emerge;
- to identify these latent possibilities (Poli, 2006, p. 77f);
- make sense out them; and
- to cultivate them in a non-imposing manner so that they can develop into "interesting" and sensible outcomes for the process of unlearning (Peschl and Fundneider, 2013).

Such a perspective of unlearning is not only about reducing the influence of "old" or obsolete knowledge, but about opening up to an uncertain unfolding reality, to its potentials, to what is latent "out there" and to co-create a novel space of knowledge (and behaviors) in a process of co-becoming. Unlearning becomes future-driven.

3.4 Future-driven unlearning as undergoing, submitting and corresponding to reality

One of the most important implications of the approach having been discussed here is a radical shift in mindsets and skills: while classic approaches of unlearning are based on the (implicit) assumption of a creative mind "dominating" over reality by inducing destabilization and directed change, we suggest to reverse this relationship, i.e. the hylomorphic perspective (Ingold, 2013) is replaced by a relationship of *co-becoming* and *correspondence*. This issue is closely related to a mindset of giving up (epistemological) control and an attitude/virtue of openness and humbleness with respect to a reality unfolding in radical uncertainty.

As Ingold (2014) suggests, creativity and creation of new knowledge and, thus, unlearning, do not (only) happen inside the creator's or unlearner's mind/brain, "but in their attending upon a world in formation. In this kind of creativity, undergone rather than done, imagination is not so much the capacity to come up with new ideas as the aspirational impulse of a life that is not just lived but led. But where it leads is not yet given. In opening to the unknown—in exposure—imagination leads not by mastery but by submission. Thus the creativity of undergoing, of action without agency, is that of life itself" (Ingold, 2014, p. 124). In a way, this calls for an agent to "think and act *with* hihe/sher environment" (rather than thinking with his/her mind/brain only). As we have seen in the extended approach to cognition (Menary, 2010; Rowlands, 2010; Clark and Chalmers, 1998), the environment plays a crucial role as an "outsourced" part of our cognition. As a simple example, think for instance, of using pen and paper for doing a complex calculation, or of a computer providing some visualizations supporting our cognitive activities in decision-making processes. More concretely, in the organizational context of future-oriented unlearning, this could be implemented in organizational and office environments enabling creative processes, quiet and concentration spaces, office spaces allowing for dialogical settings, spaces in the (natural) surrounding or regular organizational routines and times for explicitly questioning premises of the organization. In this sense, the (artifact) environment is coupled to and becomes part of our cognitive processes and plays an active causal role for their proper functioning (Clark and Chalmers, 1998, p. 8f). For our approach to unlearning, these insights

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have the following implications: it is necessary to explicitly design for such organizational environments comprising both material and non-material structures and processes that support these unlearning processes ("Enabling Spaces") (Peschl and Fundneider, 2014a, 2014b). Furthermore, for anticipating future potentials, it is necessary to enter into a close relationship with the environment.

This activity is about anticipating (not in the narrow sense of predicting) possible future states of the world or organization by intimately engaging with it. This results into acquiring profound knowledge about potentialities and adjacent possibles (Kauffman, 2014) by knowing them "from within". Instead of looking and observing from the outside only, one tries to penetrate deeper into the core or essence of the object to be changed (e.g. organizational routines or mindsets; Scharmer, 2007; Bortoft, 1996). It is not only about acquiring knowledge or reflecting premises and identifying knowledge frameworks, but about actively interacting with the (organizational) environment: one changes the perspective from an external observer only to an internal perspective of actively being part of and involved in the processes of intervention and enacting. It is a kind of "thinking with the environment," which does not only result in knowing the (organizational) system and its ecosystem from the inside, but also in getting an understanding of its future potentials that are emerging in this process.

In this context, "thinking with the environment" does not only mean to "think" about the world, but to enter into a (*n* existential) process of co-becoming and corresponding with the world (Ingold, 2013; Roth *et al.*, 2016) or to submit to the world. In being so close to the world, we can be both with and "one step ahead of the material/world" (Sennett, 2008, p. 175). We are not imposing our ideas on the world, but we are "feeling-forward" (Ingold, 2014, p. 136f) together with reality. Both the environment and the creator/agent co-become in a process of unlearning and enter into an emerging unity going in the direction of a yet unknown change/creation. "This is a matter not of predetermining the final forms of things and all the steps needed to get there, but of opening up a path and improvising a passage. To foresee, in this sense, is to see into the future, not to project a future state of affairs in the present; it is to look where you are going, not to fix an endpoint. Such foresight is [. . .] not prediction" (Ingold, 2013, p. 69). What Ingold calls foreseeing is closely related to the processes happening when one is identifying future potentials, it is a kind of "pre-sensing" (Scharmer, 2007).

As we have seen, such a future-driven perspective on unlearning emphasizes the role of the environment: instead of a creative mind, reality itself is the primary source of change and novelty by providing a space of adjacent possibles/potentials. The temporal sequence/causality is reversed: it is not the creative idea leading to a transformation of the (organizational) environment, but the potentials in the environment (including the organization) leading the dynamics of the mind and the process of unlearning; they are inviting it into a close cooperation and co-development of its potentials. As a consequence, we have to undergo reality. "As such, it leads from the front rather than directing from behind. But where it leads is not yet plotted out before the act begins" (Ingold, 2014, p. 135). What Ingold describes here is in accordance with our discussion about the importance and priority of emergent final cause in unlearning and bringing potentiality into actuality. "Leading from the front" implies that the emergent final cause/purpose attracts, "pulls," or leads the dynamics of the transformation processes rather than "being directed from behind" by the efficient cause of the mind trying to shape or manipulate reality (or the results of unlearning) according to its preconceived ideas or goal states. The creative mind is engaged with the environment and follows its form-generating potentials by entering in a joint process of growing and co-becoming. This is what we refer to as future-driven and open-ended unlearning by correspondence (Ingold, 2013; Roth *et al.*, 2016).

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4. Conclusions

One of the main goals of this paper was to establish an under-researched and alternative form of unlearning that is based on an open-ended and future-oriented understanding of change and (un-)learning. It is informed and led by emergent future potentials rather than by preconceived knowledge- or learning goals. Such an approach to unlearning does not only focus on reflecting on existing knowledge, routines or values and on identifying what is obsolete and how the influence of old knowledge could be reduced (Grisold *et al.*, 2017). We showed that, due to the open-ended character of the unlearning process, it is important to understand that this open-endedness has an impact on how the unlearning process itself is set up.

4.1 Key findings

Here are some of the key findings of an open-ended future-driven approach to unlearning:

- the goal of unlearning does not necessarily have to be given in advance;
- it is important to find a good balance between internal and external (organizational) constraints and emergent future purposes;
- it is necessary to reduce the control of the unlearner's mind in the sense of giving up (epistemic) control by not imposing our ideas to the world, but by "thinking with the environment" and entering into a (*n* existential) process of co-becoming and corresponding with and submitting to the world (Ingold, 2013; Roth *et al.*, 2016) in unlearning processes; and
- In a highly uncertain and unpredictable world, following a strategy of co-becoming with an unfolding environment and with an emergent goal seems to be more promising than aiming at a preconceived (un-)learning goal.

4.2 Theoretical implications

In future-driven and open-ended unlearning processes, it might seem that the cognitive agent is put into a rather passive role. This is misleading, however, as the agent has to be not only highly engaged in deeply knowing his/her environment (from within), but he/she has to actively listen to, interact with and co-develop reality and its potentials. Hence, undergoing is not passive, it is "active undergoing, in which submission leads, [it] is a kind of action without agency [. . .] you do not initiate it; rather, it behooves to you [. . .]. It has no point of origin; it cannot be traced to an intention [. . .]. It is rather part of a never-ending process of attention and response [. . .]. Just as the 'already' is always behind us, [. . .] so the 'not yet' will always escape ahead of us, beyond the horizon of our expectations" (Ingold, 2014, p. 137f). Hence, what we are dealing here with is a kind of "active passivity" in the sense of actively giving up/reducing (epistemological) control and switching to a mode of *attentively molding the (organizational) environment and at the same time being molded by it*; unlearning understood in this way is an activity of *leading and being led at the same time*.

Thus, such a future-oriented approach to unlearning has to be understood as an *emergent* process rather than being led by a preconceived idea only: the final form of the resulting change (or novel knowledge) is not known in every detail from the outset. Of course, the cognitive agent has some initial idea in his/her mind or is triggered by some problem (Hedberg, 1981), and there will be some constraints on the part of the organization(-al capabilities) (Lindner and Foss, 2018), markets or users. However, in the course of the interaction with the environment, this idea might be changed dramatically or has to be given up completely. Complex and uncertain futures do not allow for defining a clear goal in

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advance and trying to achieve it at any price. Rather, it has turned out that we have to be receptive to what wants to emerge and to go with the flow in a process of co-creation and co-becoming with an unfolding future.

One consequence of the approach having been proposed in this paper is that unlearning always involves *personal change* and *transformation*. As we have seen in the discussion about co-becoming and correspondence, it is not sufficient to just apply a preconceived concept or idea to the environment and/or to react to what does not work in the process of realizing one's (unlearning) plan or concept. Rather, it has become clear that the agent (and his/her idea or concept) has to fully engage and co-develop with his/her environment in a process of co-becoming. From an unlearning perspective, this means that one has to change first on a personal and existential level (deeply reflecting and reframing attitudes, mindsets, skills, etc.) and only then will be capable of engaging with the environment in such an intimate and future-oriented unlearning process as has been sketched above.

4.3 Implications for practices

If one intends to apply such processes of future-driven and open-ended unlearning, an organization has to acquire and cultivate future-oriented (epistemic) skills, practices and mindsets that go beyond classic management and leadership skills as they are taught in most MBA programs (mostly focusing on analytical skills, control, planning, etc.). Only then we will be able to enter into a process of unlearning by co-creating a thriving future by learning from it as it emerges (compare also Miller, 2015, 2018). Here are some of the most important skills and mindsets that should be present in an organization engaging in such open-ended unlearning processes:

- *Mindset of openness* (individually, organizationally and in leadership): As we have seen such a form of unlearning is not only about letting go obsolete knowledge, but about being open toward future potentials and "what wants to emerge." In this sense, it is necessary to acquire skills for being open to and identifying the "not yet" and that what is possible, such as learning to deeply understand the core of one's business and to identify its untapped potentials.
- *Reducing or being out of control*: "Being out of control [. . .] can be seen as offering more options [. . .] it is a way of increasing our creativity" (Glanville, 2007, p. 1195). Although our mind is heavily determined by our past experiences (Clark, 2016; Hohwy, 2013), we have to give up the idea that we can gain control over a highly unpredictable environment. It is necessary to let go from our past experiences, and only then we will be able to "see" potentials that are going beyond our projections from the past. In most cases, they will not be under our control.
- The previous point is closely related to the ability of being able to *wait* and to switch to a mode of *patience* or "in/non-action." "Voluntary inaction" is a powerful point of departure for reflection and opening up to still emerging future potentials, opportunities and possible goals as well as purposes for the unlearning process.
- As an implication of the above points, it is necessary to develop skills and a mindset of (organizational) *receptivity* (Scott and Davis, 2016) and *humbleness* to be "impressed" and changed by environmental dynamics that do not follow one's or the organization's expectations and plans. This is particularly hard in organizations that are heavily driven by routines, processes and efficiency.
- Being able to *redirect* and *reframe* one's patterns of perception, cognition and behaviors (Scharmer, 2007; Depraz *et al.*, 2003): open-ended unlearning is not only about reflection of existing knowledge and routines, but also involves the capacity

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to redirect one's standpoint and perspective (Scharmer, 2007). This leads to a process of reframing one's patterns of perception opening up completely new spaces of opportunities and knowledge in which novel behaviors may emerge.

- To be able to embrace uncertainty, it is necessary to engage with and *immerse deeply into one's environment* (be it the organization or the users and their needs) into unknown opportunities and the space of adjacent possibles. Only then we will be able to know them "from within" and will be prepared to be "pulled" and attracted by purpose/final cause emerging from potentials rather than pushing unlearning towards preconceived outcomes.
- Finally, it is important to actively *provide and design for enabling organizational infrastructures* ("Enabling Spaces"; Peschl and Fundneider, 2014a, 2014b) supporting these kinds of unlearning processes. Apart from (organizational, epistemological and physical) spaces (in a broad sense) for reflection and destabilization, it is critical to understand that such open-ended unlearning processes cannot be fully controlled. Rather, a mindset of *enabling* has to be manifest in spaces for non-action, listening, emergence and openness for future potentials. This may be realized in specific office space settings, in ways of communicating, in living values of being open for novelty and innovation, in educating employees' future skills and mindsets, etc.

4.4 Future research

As the resulting purpose or possible value of the unlearning process can neither be planned nor is it given in advance, we have to further investigate what it means that such a purpose emerges and unfolds in a process of co-becoming as final cause. For the operational domain, this means that further research has to be done on identifying enabling conditions that facilitate and support such emergent processes both on an individual and on an organizational level.

Furthermore, we will have to develop further insights and experiences on the fact that focusing on the back end of unlearning does not only change its outcome, but large parts of the unlearning process itself. It is not only open-ended, but also a process of "unlearning as learning from the future as it emerges."

Note

1. The term of "back end" is borrowed from the field of innovation and knowledge studies where – as opposed to "front end of innovation" – the "back end of innovation" denotes the final phases, outcomes of a knowledge or an innovation process and its implementation (Baregheh *et al.*, 2009; Fagerberg, 2006; Tidd and Bessant, 2009).

References

Amabile, T. (1996), *Creativity in Context*, Westview Press, Boulder.

Aristotle (1991), "Metaphysics", in Barnes, J. (Ed.), *The Complete Works of Aristotle: The Revised Oxford Translation*, Princeton University Press, Princeton, NJ, Vol. 2.

Baregheh, A., Rowley, J. and Sambrook, S. (2009), "Towards a multidisciplinary definition of innovation", *Management Decision*, Vol. 47 No. 8, pp. 1323-1339.

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Becker, K.L. (2018), "Knowledge management and unlearning/forgetting", in Syed, J., Murray, P.A., Hislop, D. and Mouzughi, Y. (Eds), *The Palgrave Handbook of Knowledge Management*, Palgrave Macmillan, Cham, CH, pp. 105-130.

Bennett, N. and Lemoine, G.J. (2014), "What a difference a word makes: understanding threats to performance in a VUCA world", *Business Horizons*, Vol. 57 No. 3, pp. 311-317.

Bloch, E. (1986), *The Principle of Hope*, MIT Press, Cambridge, MA, Vol. 3.

Bortoft, H. (1996), *The Wholeness of Nature: Goethe's Way of Science*, Floris Books, Edinburgh.

Brook, C., Pedler, M., Abbott, C. and Burgoyne, J. (2016), "On stopping doing those things that are not getting us to where we want to be: unlearning, wicked problems and critical action learning", *Human Relations*, Vol. 69 No. 2, pp. 369-389.

Chia, R. and King, I.W. (1998), "The organizational structuring of novelty", *Organization*, Vol. 5 No. 4, pp. 461-478.

Clark, A. (2016), *Surfing Uncertainty. Prediction, Action, and the Embodied Mind*, Oxford University Press, Oxford.

Clark, A. (2018), "A nice surprise? Predictive processing and the active pursuit of novelty", *Phenomenology and the Cognitive Sciences*, Vol. 17 No. 3, pp. 521-534.

Clark, A. and Chalmers, D. (1998), "The extended mind", *Analysis*, Vol. 58 No. 1, pp. 7-19.

Depraz, N., Varela, F.J. and Vermersch, P. (2003), *On Becoming Aware. A Pragmatics of Experiencing*, John Benjamins Publishing Company, Amsterdam/Philadelphia.

Dorst, K. (2003), "The problem of design problems", in Cross, N. and Edmonds, E. (Eds), *Expertise in Design*, Creativity and Cognition Studio Press, Sydney, pp. 135-147.

Fagerberg, J. (2006), "Innovation: a guide to the literature", in Fagerberg, J., Mowery, D.C. and Nelson, R.R. (Eds), *The Oxford Handbook of Innovation*, Oxford University Press, Oxford, pp. 1-26.

Fiol, M. and O'Connor, E. (2017), "Unlearning established organizational routines – part I", *The Learning Organization*, Vol. 24 No. 1, pp. 13-29.

Glanville, R. (2007), "Try again. Fail again. Fail better: the cybernetics in design and the design in cybernetics", *Kybernetes: The International Journal of Systems and Cybernetics*, Vol. 36 Nos 9/10, pp. 1173-1206.

Grisold, T. and Kaiser, A. (2017), "Leaving behind what we are not: applying a systems thinking perspective to present unlearning as an enabler for finding the best version of the self", *Journal of Organisational Transformation and Social Change*, Vol. 14 No. 1, pp. 39-55.

Grisold, T. and Peschl, M.F. (2017a), "Why a systems thinking perspective on cognition matters for innovation and knowledge creation: a framework towards leaving behind our projections from the past for creating new futures", *Systems Research and Behavioral Science*, Vol. 34 No. 3, pp. 335-353.

Grisold, T. and Peschl, M.F. (2017b), "Change from the inside out: towards a culture of unlearning by overcoming organizational predictive mind", in Tomaschek, N. and Unterdorfer, D. (Eds), *Veränderung: Der Wandel Als Konstante Unserer Zeit*, Waxmann, Münster, New York, NY, pp. 45-63.

Grisold, T., Kaiser, A. and Hafner, J. (2017), "Unlearning before creating new knowledge: a cognitive process", *Proceedings of the 50th HI International Conference on System Science (HICSS), AIS Electronic Library (AISeL), HI*, pp. 4614-4623.

Hartner-Tiefenthaler, M., Rötzer, K., Bottaro, G. and Peschl, M.F. (2018), "When relational and epistemological uncertainty act as driving forces in collaborative knowledge creation processes among university students", *Thinking Skills and Creativity*, Vol. 28, pp. 21-40.

Hedberg, B. (1981), "How organizations learn and unlearn", in Nystrom, P. and Starbuck, W.H. (Eds), *Handbook of Organizational Design*, Cambridge University Press, London, Vol. 1 , pp. 8-27.

Hennessey, B.A. and Amabile, T.M. (2010), "Creativity", *Annual Review of Psychology*, Vol. 61 No. 1, pp. 569-598.

Downloaded from http://ftp.nowpublishers.com/tlo/article-pdf/26/5/454/2880313/tlo-11-2018-0192.pdf by guest on 29 June 2026

Hislop, D., Bosley, S., Coombs, C.R. and Holland, J. (2014), "The process of individual unlearning: a neglected topic in an under-researched field", *Management Learning*, Vol. 40 No. 5, pp. 540-560.

Hohwy, J. (2013), *The Predictive Mind*, Oxford University Press, Oxford.

Hsu, S.W. (2013), "Alternative learning organization", in Örtenblad, A. (Ed.), *Handbook of Research on the Learning Organization: Adaptation and Context*, Edward Elgar Publishing, Cheltenham, pp. 358-371.

Ingold, T. (2013), *Making. Anthropology, Archaeology, Art and Architecture*, Routledge, Abingdon, Oxon; New York, NY.

Ingold, T. (2014), "The creativity of undergoing", *Pragmatics and Cognition*, Vol. 22 No. 1, pp. 124-139.

Johnson-Laird, P.N. (2004), "The history of mental models", in Manktelow, K. and Chung, M.C. (Eds), *Psychology of Reasoning: Theoretical and Historical Perspectives*, Psychology Press, New York, NY, pp. 179-212.

Kauffman, S.A. (2014), "Prolegomenon to patterns in evolution", *BioSystems*, Vol. 123, pp. 3-8.

Klammer, A. and Gueldenberg, S. (2019), "Unlearning and forgetting in organizations: a systematic review of literature", *Journal of Knowledge Management*, Vol. 23 No. 5, pp. 860-888.

Krippendorff, K. (2011), "Principles of design and a trajectory of artificiality", *Journal of Product Innovation Management*, Vol. 28 No. 3, pp. 411-418.

Lindner, S. and Foss, N.J. (2018), "Microfoundations of organizational goals: a review and new directions for future research", *International Journal of Management Reviews*, Vol. 20, pp. S39-S62.

Menary, R. (2010), *The Extended Mind*, MIT Press, Cambridge, MA.

Miller, R. (2015), *Making Experimentalist Leadership Practical: The Theory and Practice of Futures Literacy*, Centre for Strategic Education Seminar Series Paper, Victoria, doi: 10.13140/RG.2.1.3467.1844.

Miller, R. (2018), *Transforming the Future: Anticipation in the 21st Century*, Routledge, Oxon, New York.

Mitleton-Kelly, E. (2007), "The emergence of final cause", in Aaltonen, M. (Ed.), *The Third Lens: Multi-Ontology Sense-Making and Strategic Decision-Making*, Ashgate Publishing, Adlershot, pp. 111-124.

Mumford, M. (2012), *Handbook of Organizational Creativity*, Academic Press, San Diego, CA.

Paulus, B.P., Putman, V.L.L., Dugosh, K., Dzindolet, M.T. and Coskun, H. (2002), "Social and cognitive influences in group brainstorming: predicting production gains and losses", *European Review of Social Psychology*, Vol. 12 No. 1, pp. 299-325.

Peschl, M.F. (2018a), "Shifting from collaboration with others to collaboration with the future in design and innovation processes", in DMI Design Management Institute (Ed.), *Next Wave: The 21st Dmi: Academic Design Management Conference Proceedings*, DMI, Boston, Mass, pp. 279-288.

Peschl, M.F. (2018b), "Rethinking forms of collaboration for creating sustainable innovation and novelty for a thriving future", in Bolisani, E., Di Maria, E. and Scarso, E. (Eds), *Proceedings of the 19th European Conference on Knowledge Management*, University of Padova, Padova, pp. 685-692.

Peschl, M.F. and Fundneider, T. (2013), "Theory-U and emergent innovation: presencing as a method of bringing forth profoundly new knowledge and realities", in Gunnlaugson, O., Baron, C. and Cayer, M. (Eds), *Perspectives on Theory U: Insights from the Field*, Business Science Reference/IGI Global, Hershey, PA, pp. 207-233.

Peschl, M.F. and Fundneider, T. (2014a), "Why space matters for collaborative innovation networks. On designing enabling spaces for collaborative knowledge creation", *International Journal of Organisational Design and Engineering*, Vol. 3 Nos 3/4, pp. 358-391.

Downloaded from http://ftp.nowpublishers.com/tlo/article-pdf/26/5/454/2880313/tlo-11-2018-0192.pdf by guest on 29 June 2026

Peschl, M.F. and Fundneider, T. (2014b), "Designing and enabling interfaces for collaborative knowledge creation and innovation. From managing to enabling innovation as socio-epistemological technology", *Computers and Human Behavior*, Vol. 37, pp. 346-359.

Poli, R. (2006), "The ontology of what is not there", in Malinowski, J. and Pietruszczak, A. (Eds), *Essays in Logic and Ontology: Poznan Studies in the Philosophy of the Sciences and the Humanities*, Rodopi, Amsterdam/New York, NY, Vol. 91, pp. 73-80.

Risto, H. (2011), "Artifact", in Zalta, E.N. (Ed.), *The Stanford Encyclopedia of Philosophy*, Metaphysics Research Lab, Stanford University, Stanford, available at: https://plato.stanford.edu/entries/artifact/

Roth, W.M., Socha, D. and Tenenberg, J. (2016), "Becoming-design in corresponding: re/theorising the co- in codesigning", *CoDesign*, Vol. 12 No. 1, pp. 1-15.

Rowlands, M. (2010), *The New Science of the Mind: From Extended Mind to Embodied Phenomenology*, MIT Press, Cambridge, MA.

Sarasvathy, S.D., Dew, N., Velamuri, S.R. and Venkataraman, S. (2003), "Three views of entrepreneurial opportunity", in Acs, Z.D. and Audretsch, D.B. (Eds), *Handbook of Entrepreneurship Research*, Kluwer Academic Publishers, Dordrecht, NL, pp. 141-160.

Scharmer, C.O. (2007), *Theory U. Leading from the Future as It Emerges: The Social Technology of Presencing*, Society for Organizational Learning, Cambridge, MA.

Schein, E.H. (1993), "On dialogue, culture and organizational learning", *Organizational Dynamics*, Vol. 22 No. 2, pp. 44-51.

Scott, W.R. and Davis, G.F. (2016), *Organizations and Organizing: Rational, Natural, and Open System Perspectives*, Routledge, New York, NY.

Sennett, R. (2008), *The Craftsman*, Yale University Press, New Haven, CT.

Simon, H.A. (1996), *The Sciences of the Artificial*, MIT Press, Cambridge, MA.

Tidd, J. and Bessant, J. (2009), *Managing Innovation: Integrating Technological, Market and Organizational Change*, John Wiley and Sons, Chichester.

Tsoukas, H. and Chia, R. (2002), "On organizational becoming: rethinking organizational change", *Organization Science*, Vol. 13 No. 5, pp. 567-582.

Vince, R. (2008), "Learning-in-action' and 'learning inaction': advancing the theory and practice of critical action learning", *Action Learning: Research and Practice*, Vol. 5 No. 2, pp. 93-104.

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