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Social labs as an inclusive methodology to implement and study social change: the case of responsible research and innovation

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ABSTRACT

The embedding and promotion of social change is faced with a paradoxical challenge. In order to mainstream an approach to social change such as responsible research and innovation (RRI) and make it into a practical reality rather than an abstract ideal, we need to have conceptual clarity and empirical evidence. But, in order to be able to gather empirical evidence, we have to presuppose that the approach already exists in practice. This paper proposes a social lab methodology that is suited to deal with this circularity. The methodology combines the defining features of social labs emerging from the literature such as agility and real-world focus with established theories and approaches such as action research and experiential learning. Thereby it enables the parallel investigation and propagation of RRI. The framework thus constructed provides a theoretical embedding of social labs and overcomes some of the known limitations of the constitutive approaches.

Introduction

Over the last decade, responsible research and innovation (RRI) increasingly has received attention in both the realm of research and innovation (R&I) policy (European Commission 2017a; Geoghegan-Quinn 2012) and academic research (Timmermans and Blok 2018). RRI has been defined as 'societal actors (researchers, citizens, policymakers, business, third sector organizations, etc.) work[ing] together during the whole research and innovation process in order to better align both the process and its outcomes with the values, needs and expectations of society' (European Commission 2015). Despite this attention, the embedding of RRI across R&I practices is still lacking (see, for example, European Commission 2017b, 65). Apart from frontrunners at the national level such as the Responsible Innovation (MVI) programme by the Dutch research council (NWO 2016), the Research for innovation

and sustainability. Strategy of the Research Council of Norway (RCN) (Egeland, Forsberg, and Maximova-Mentzoni 2019) and the framework for Responsible Innovation by the British Engineering and Physical Sciences Research Council (EPSRC) (Owen 2014), RRI predominantly remains a theoretical/policy ideal rather than a mainstream practice. To remedy this, funding bodies such as the European Commission (EC) have promoted research to further the understanding and uptake of RRI. To this end, the EC, for example, has funded projects such as GREAT (GREAT-project 2013), RRI practice (RRI Practice 2018) and NewHoRRIzon (New HoRRIzon 2017).

As it emerges, therefore, the RRI community is tasked with the dual objective of promoting RRI while at the same time still getting to understand it. The difficulty of this task is further compounded by two factors that reflect the nascent status of RRI: 1) RRI still is conceptually contested (Genus and Iskandarova 2017; van Lente, Swierstra, and Joly 2017) and 2) RRI suffers from a lack of empirical evidence to support its claims and assumptions (Owen and Pansera 2019; Timmermans and Blok 2018). Evidently, this conceptual and empirical immaturity creates a barrier to the uptake of RRI by R&I practitioners. Surely, why would a scientist or innovator alter his or her practice by adopting a concept or approach that is still not fully understood and, moreover, lacks the empirical evidence that backs up its claims and shows how to successfully turn this idea into practice?

The embedding and promoting of RRI, therefore, is faced with a paradoxical challenge: in order to mainstream RRI and make it into a practical reality rather than an abstract ideal we need to have conceptual clarity and empirical evidence. But, in order to be able to gather empirical evidence, we have to presuppose that RRI already exists in practice.

What is more, this challenge is further exacerbated by its repercussions on R&I policy development. The conceptual and empirical immaturity creates barriers to the uptake by policymakers in creating funding instruments and other policy interventions to drive RRI implementation. This creates another layer of circularity: without strong policy implementation and incentives for incorporating RRI as a practice in R&I projects, researchers will not embrace RRI and apply its principles. As a consequence, the evidence needed by policymakers to develop the required instruments that are based on such evidence will not be generated. While in the European context the need for RRI is expressed as a strong normative position, on the political level (cf. EC, Rome declaration on responsible research and innovation in Europe (2014)), this circularity hinders policy implementation. The conceptual immaturity and lack of evidence hampers RRI from being translated to concrete R&I policy mechanisms and R&I practices (Braun 2019). One way of dealing with this circularity is by looking at practices and narratives that constitute instances of '*de-facto* RRI' (Randles et al. 2016). Long and Blok (2017), for example, investigate open innovation as *de-facto* RRI, while Lubberink et al. (2018) do the same for social entrepreneurship., and Randles et al. (2016) discuss six narratives of de-facto RRI. Another way is by building on pre-existing approaches that have been shared under the RRI umbrella. In the literature on RRI, for instance, more established approaches such as Value-Sensitive Design (van den Hoven 2013), Midstream Modulation (Fisher and Rip 2013) and Technology Assessment (Fisher and Rip 2013; Grunwald 2011) have been brought forward to substantiate RRI. These strategies, however, are not able to fully tackle the paradox. *De-facto* RRI and the pre-existing approaches may be approximations to RRI, but they do not capture the full remit of the concept. More importantly, in most cases they suffer from the same circularity as does RRI. Similar to RRI, sustainable entrepreneurship,

social innovation, and Value-Sensitive Design can be understood as phenomena posing an abstract ideal that still lack practical evidence to support its claims and assumptions. Therefore, shifting the burden of evidence for the need to implement RRI to these similarly ideal concepts does very little to advance the cause of RRI.

In this paper, we conceptually explore an alternative strategy to deal with this circularity. Rather than seeking to avoid the circularity by building on *de-facto* practices or pre-existing approaches, we propose a dedicated research methodology based on the relatively recent idea of social labs that embraces circularity as its founding principle. Traditionally research methodologies intently seek to avoid circularity. They either test a new theory on an established practice or use an existing practice to deduce new theory. However, because of its lack of both conceptual clarity and established practice, RRI calls for a different tactic. There is the need for an approach that can proactively embrace circularity and turn it into an asset for change. Social labs methodology, we argue, offers such an approach. Social labs offer spaces for doing social experiments in a practical context where experts and stakeholders join together to initiate actions focused on tackling challenges without being constrained by predetermined project plans, lists of deliverables, and – most importantly in this context – without knowing exactly how to proceed (Hassan 2014).. In this way, social labs provide precisely the ability to proactively experiment with circularity, as both the properties of the RRI approach taken and the practical solution sought in the experiment emerge during the experiment.

Current conceptualizations of social labs, however, do not have a research focus and lack scientific rigor. Given the dual objective of promoting *and* understanding RRI, we, therefore, introduce complementary elements of established methods such as action research and experiential learning into our social lab methodology. Action research shares a practical orientation with extant social lab approaches but joins this to a clear research focus. The theory of experiential learning (Moon 2004) allows for systematic inclusion of a continuous cyclic exchange between conceptual abstractions and concrete experience. Together, the two allow us to add a layer of scientific data gathering and theory building to existing social lab methodology. Thus, with this scientific social lab methodology the emerging properties of RRI can be researched and promoted in a practical setting in which researchers collaborate with stakeholders and experts on the practical issues of RRI.

The paper starts by first introducing RRI as an emerging social phenomenon. This allows us to further articulate what is to be expected of a methodology that is fit for the dual purpose of researching and promoting such emerging social phenomena. Secondly follows a conceptual discussion of the main features of social labs and how these are fit to deal with the hermeneutic nature of emerging social phenomena. Third, building on the established methods and theories of action research, experiential learning and mutual learning, we propose a social lab methodology that incorporates the salient features, while addressing the known shortcomings of social labs. The paper finishes by drawing conclusions and by making recommendations for further research on the suggested social lab approach.

RRI as an emerging social phenomenon

Similar to, for example, sustainable development (e.g. Gladwin, Kennelly, and Krause 1995; Zagonari 2016) and social innovation (Bolz and de Bruin 2019; Howaldt, Domanski,

and Kaletka 2016), in this paper, RRI is understood as an emerging social phenomenon that seeks to engender a practical transition by setting a theoretical ideal. First, RRI results from complex, distributed social interaction mainly amongst academics (theorizing about RRI), policymakers and researchers and innovators (implementing RRI). Therefore, it must be regarded as a social phenomenon. Second, the properties of RRI are not yet known in advance nor can they be reduced to the individual contributions of the actors involved. Instead, they gradually come into existence during and resulting from the social interactions of the different actors.

This process of emergence can be understood as a hermeneutic process (Gadamer 1988). To capture the overall phenomenon, we have to understand the interaction between individual contributions. At the same time, the individual contributions can only be understood in light of the overall phenomenon. As an emerging social phenomenon, therefore, RRI can only be understood by going back and forth between the individual constitutive parts and the overall phenomenon while it comes into being. As a consequence, the object of this process (RRI) and the subjects involved (the different actors) cannot be separated, but are necessarily intertwined: the object does not exist apart from the (cognitive, normative, etc.) mental images and perception of the subjects about the object. For example, what RRI is and will become, depends on the (democratic) ideals held by the different RRI theorists but also on the way it is being implemented by researchers and innovators.

This is in stark contrast with more traditional perceptions of research and development processes. There, the subject who is conducting the research or development is (assumed to be) positioned outside of the object that is being researched/developed. For example, a biologist studying or creating a micro-organism in his lab presumes a strict separation between the biologist (subject) and the organism (object). This strict division of object and subject also carries over to the methodologies supporting the research and development process. As a result, methodologies that are used for traditional (social) research and development are not (necessarily) fit for investigations into emerging social phenomena. This inherent inclusion of the subject in the object of emerging social phenomena adds an additional layer of complexity to the challenge of understanding and promoting such phenomena. In the remainder of this paper, we will propose a social lab approach as a possible alternative methodology that does justice to the hermeneutic nature of emerging social phenomena.

The six features of social labs for emerging social phenomena

In this section, we present a conceptual discussion on how social labs are fit to deal with the hermeneutic nature of emerging social phenomena such as RRI. First, we discuss the idea of a social lab, its genesis, and how it is distinct from other (preceding) labs. This discussion culminates in an outline of the main features of social labs. We then go on by critically assessing the fitness of the features to the social lab methodology with the dual aim of investigating and promoting emerging social phenomena. This will act as a stepping stone for the next section that will propose a scientifically grounded method for our social lab approach.

The term 'social lab' was first introduced by Zaid Hassan (2014). He defines social labs as 'platforms for addressing complex social challenges that have three core characteristics:

they are social […] experimental […] [and] systemic' (Hassan 2014, 3). Like others, according to Hassan social labs are part of a long tradition of experimentation and development dating back to the 18 and 19th centuries (Mulgan 2014). Traditionally the concept of a laboratory was focused on the domains of (natural) science and technology (Mulgan 2014; Rodrigues, Cubista, and Simonson 2015). Apart from some early works such as that of John Dewey on laboratories dedicated to education and community cooperation, only recently laboratories have become associated with societal transitions (Mulgan 2014; Rodrigues, Cubista, and Simonson 2015; Romero-Frías and Robinson-García 2017).

At the forefront of this development were media- (Brand 1988; Romero and Molina 2011), living- (Følstad 2008) and innovation-labs (Magadley and Birdi 2009). Although these labs still are predominantly technology-based, they often also include a social component (Mulgan 2014). On the one hand, this social component could refer to the inclusion of stakeholders in the lab, although in most cases this would be limited to the end-users of technology rather than a wider group of stakeholders. On the other hand, social challenges sometimes are included as a target of the technological innovations and solutions provided by these labs. Taking it a step further, social labs truly move away from technology and natural sciences focus by making social change their main *raison d'être*. Moving beyond the traditional labs, in social labs both the subject and object of the lab are social in nature, i.e. involving social actors and addressing social challenges by doing social innovation.[1] So, in the case of RRI, rather than traditional innovation, design or technology, the social lab's object would be R&I policy. Consequently, the subjects would include all types of actors involved in (a particular) R&I as well as experts from the different disciplines encompassed by RRI.

Foremost, the 'social' in social labs is associated with the lab as a vehicle to address social problems (Westly et al. 2011) or challenges (Hassan 2014). Social labs, for example, have been applied to address sustainability (Rodrigues, Cubista, and Simonson 2015; Westly et al. 2011), poverty alleviation (Hassan 2014) and social cohesion in municipalities (Kieboom 2014). Social challenges are considered to be complex (Dessers et al. 2014; Hassan 2014; Kieboom 2014; Westly et al. 2011) or wicked (Lake, Hannah, and Eardley 2016 cf. Rittel and Webber 1973). They are characterized by having a high level of uncertainty and unpredictability, and therefore disrupt predefined plans (Hassan 2014; Rodrigues, Cubista, and Simonson 2015; Westly et al. 2011). Also, they are emerging, which means that their 'properties arise from the interaction of the many parts.' (Hassan 2014, 19) As a result, in complex systems, there is 'a constant flow of information to negotiate […] [meaning that] actors are constantly adapting their behavior' (Hassan 2014, 20). As a consequence, tackling them is not straightforward and requires active engagement and responsible action (Blok, Gremmen, and Wesselink 2015).

In order to be able to adequately deal with the complex, emergent nature of social challenges, social labs have the following features:

(1) In line with earlier incarnations of labs, social labs offer a space for experimentation (Hassan 2014; Kieboom 2014; Romero-Frías and Robinson-García 2017). As such they have an orientation to action, involving prototypes such as interventions and solutions that need to be developed, tested and applied.
(2) Social labs are not closed off from the outside world, but intently are a part of the real world (Hassan 2014; Kieboom 2014; Lake, Hannah, and Eardley 2016). The solutions

thus are developed and tested out in the particular social context where the challenges they address stem from. Hence, the experiments conducted in and by the lab are typified as *social experiments* (Kieboom 2014).

(3) They require active participation of a wide range of societal stakeholders that are of relevance to or have an interest in the social challenge, such as policymakers, businesses, government, and civil society (Dessers et al. 2014; Hassan 2014; Kieboom, Sigaloff, and van Exel 2015; Rodrigues, Cubista, and Simonson 2015; Romero-Frías and Robinson-García 2017; Westly et al. 2011).

(4) Social labs are multi- and interdisciplinary involving a wide range of expertise and backgrounds as well as approaches (Hassan 2014; Kieboom, Sigaloff, and van Exel 2015; Romero-Frías and Robinson-García 2017; Westly et al. 2011).

(5) They support solutions and prototypes on a systemic level (Hassan 2014; Kieboom 2014; Rodrigues, Cubista, and Simonson 2015; Romero-Frías and Robinson-García 2017). So, rather than dealing with symptoms or parts of a social challenge, social labs aim to achieve systemic change.

(6) Social labs have an iterative, agile approach (Hassan 2014; Lake, Hannah, and Eardley 2016). Rather than relying on a pre-set plan, agility breaks down the process into little bits. This allows it to make many iterations, closely inspecting the process and adapting it along the way to accommodate unplanned events, emerging properties and information. Learning and empowerment of the social lab participants, therefore, is crucial to this process. Multiple iterations and learning cycles, allow the evolution of prototypes and solutions over time (Cf. Hassan 2014; Lake, Hannah, and Eardley 2016).

All six features are of relevance to deal with the hermeneutic nature of the emerging social phenomenon RRI. Due to the inherent complexity of such phenomena, the involvement of a wide range of backgrounds and expertise is necessary (feature 4). Besides, to do justice to the hermeneutic and emerging nature of RRI, the inclusion of all the different societal actors involved in the social interaction that RRI emerges from, be it political, academic or operational, is called for (feature 3).

Moreover, in order to adequately tackle this type of challenges, a systemic approach (feature 5) rather than piecemeal addressing of facets, is most suited. It has, for example, been argued that sustainability (Geels 2011) as well as RRI (Fisher and Rip 2013) require a transition at the micro, meso and macro levels. The contextual embeddedness of social challenges requires an approach that is experimental (feature 1) and vested in the real world (feature 2). This makes it possible to develop and test practical solutions in a real-life context and to apply them on an experimental basis to the social realities that make up that context. In addition, the experimental lab-setting allows the actors to freely engage with each other in a secure environment. This way, the social relationships and interaction between the subjects, which are crucial in the process of the object's emergence, can be undertaken in a context of mutual trust. Furthermore, by including representatives of the 'real world', it can be ensured that the emerging properties of the phenomenon have practical meaning. For example, by including innovators in the realm of big data, the co-constructed instance of RRI will be attuned to tackling social and ethical challenges surrounding big data such as privacy and discrimination (E.g. Stahl, Timmermans, and Mittelstadt 2016). Lastly, the emerging character of the social phenomena necessitates an

approach that is experimental (feature 1) and agile (feature 6) in order to adapt to new knowledge and events. The emerging properties of the phenomenon arise by going through an iterative hermeneutic process: by engaging with the social phenomenon (the object), the subjects involved in the social lab gradually come to understand its particular properties. At the same time, in the process of understanding it, that object actually comes into being and can then be engaged further by the subjects. The agility of the social lab approach then assures that the diverse subjects have enough room in this co-construction process to instill their particular expertise and interests into it.

Theoretical and methodological grounding of the social lab approach

The conceptual discussion of social labs provides us with a clear overview of the defining features of social labs and how these are salient for dealing with social emerging phenomena such as RRI. However, the discussion does not provide the theoretical and methodological grounding that is needed for the dual aim of promoting *and* researching emerging social phenomena. To contribute to enabling social labs for scientific and research purposes we continue by critically discussing theories and methods in support of these functions. These discussions start by exploring the methods and theories brought forward by the extant literature on social labs. Next, building on these suggestions, we introduce complementary arguments and theories that further substantiate the grounding of the different social lab features.

Social lab participant recruitment

As social lab features 3 and 4 make clear, it is crucial for effective social labs to include the right set of actors. To theoretically ground these two features, Hassan (2014) discusses actor recruitment in three instances. First, Hassan builds upon Greer's notion of catabolic collapse (Greer 2005) and Bourdieu's idea of social capital (Bourdieu 2008) to introduce a holistic view on capital as a central idea behind social labs. According to this view, actors in the lab require different forms of capital in order to change social systems, for example, cultural, human, physical, and financial. Second, in addressing recruitment and the group process of social labs, Hassan touches upon the notion of 'external teams' by Ancona, Ancona, and Bresman (2007). This notion provides theoretical grounding for the inclusion of diverse and multi-sector actors and having an agile, flexible team process. And third, Hassan refers to Foucault's notion of power as a relationship, Nye's soft power, and the idea of small-world networks by Watts and Strogatz (1998) to discuss the need to include participants who have influence based on their position in social networks. Likewise, Lake, Hannah, and Eardley (2016) provide theoretical grounding for their educational social lab by discussing three essential capacities required by the students in the social lab: epistemic humility, creative confidence, and open-minded advocacy based on works by Kelley and Kelley(2013), Ramaley (2014) and Shrader-Frechette (2002).

Overall, these theories help to underpin the necessity to include individuals and groups into a social lab that support the specificities of its processes, namely its agility, creativity and focus on systemic change, as well as its effectiveness, namely by requiring participants to have the power to exert influence. On a substantive level, however, these theories have little to offer beyond generically requiring diverse and multisector actors and different

types of capital to be included. Moreover, because these theories discuss the use of social labs in general (or for educational purposes), they do not touch upon the possible particularities of social labs that have RRI as their object.

To that end, we suggest social lab participants be selected by applying a form of stakeholder mapping to the specific field of the social challenge at hand. There can be a number of such maps constructed. Referring to the quadruple helix concept (Carayannis and Campbell 2009), a simple mapping would be to bring representatives of the four helixes (research/academia; industry; public service; Civil Society Organizations (CSOs)) as participants. According to Clarkson (1994), there is no stake without risk. As Brown and Guston (2009) argue, the social aspects of research and innovation, as well as its rights-based nature, is to be understood as a way of initiating a discussion on what sort of research is appropriate, legitimate and desirable Raman and Mohr (2014). Stakeholders have different risks, claims, interests and values, therefore it is important to have some clarity on what these stakes and claims may be, and who or which stakeholder group should be involved in a specific research and innovation process (Blok 2019).

Social experiments and theories of learning

According to features 1 and 2, a social lab essentially revolves around conducting social experiments. A social experiment is an intervention that is built on the level of the social lab and tested in a relevant social context i.e. a particular case that is representative of the social challenge that is being tackled by the lab. The aim of the interventions is to accelerate and/or improve the social innovation-processes that are already taking place within the cases. To support the collaborative and iterative problem-solving process and, eventually, distilling a solution or new knowledge from the experiment Lake, Hannah, and Eardley (2016) provide theoretical grounding for their educational social lab approach by referring to the theory of experiential learning (Kolb 1984) and the subsequent collective learning by Brown and Lambert (2012) that use Kolb's ideas as a basis for collective social learning. However, apart from suggesting these theories, Lake et al. do not provide any further explanation on how these theories could be deployed in a social lab approach.

We concur with Lake et al. that the theory of experiential learning is central to conducting experiments. Experiential learning is the continuous process of learning through experience where experience is transformed into knowledge (Moon 2004). While conducting the experiments, experiential learning allows to systematically include a continuous cyclic exchange between conceptual abstractions and concrete experience. This way it supports and enhances the agile and flexible character of social labs (feature 6). Due to the inherent complexity and uncertainty of the challenges addressed, there can be no predetermined plan (Cf. Hassan 2014). So, based on the findings and insights gained during the experiments, the participants have to decide how to continue the process and Kolb offers good footholds to conduct and understand that process.

Working with social experiments is anchored in 'experiential learning cycles' (Kolb 1984; Moon 2004). Experiential learning is dedicated to the development, testing, evaluation, and re-design of interventions addressing the social challenge at hand. It distinguishes two dimensions in the learning process: a) concrete experience versus abstract conceptualization as two dialectically related modes of grasping experience, and b) active experimenting versus passive observation as two dialectically related modes of

transforming experience (Kolb and Kolb 2009). According to Kolb, effective learning would involve going through both stages of each dimension, which together constitute a learning cycle consisting of four consecutive phases (see Figure 1): concrete experience, reflective observation, abstract conceptualization, and active experimentation (Moon 2004). Going through the cycle, the social lab participants will analyze and conceptualize a challenge from their concrete experiences, learn from these experiences, and will plan actions from what they learned. Furthermore, by going through the cycle repeatedly, these actions will be assessed and iteratively adapted (feature 6). The cycle has no fixed starting point, so learning can commence from each of the four phases.

To facilitate dialogue and interaction between the social lab participants and the further stakeholders representing the broader social context of the addressed social challenge, Zwart et al. (2017)'s 'Mutual Learning Exercise' (MLE) approach can be applied. MLE's aim is 'to bring together various groups of stakeholders (researchers, potential users, intermediaries, professionals, students, media, broader public) to facilitate an interactive learning process through mutual exposure of views and experiences, expectations and concerns' (Zwart et al. 2017, 130). MLE encourages in-depth dialogues, since it provides a 'stage where multiple (and sometimes unexpected) perspectives are mutually exposed to one another, in order to move beyond traditional 'experts vs. lay audience' forms of exchange, thereby allowing participants to mutually probe and question each other's views' (Zwart et al. 2017, 130).

In order to operationalize experiential and mutual learning in social labs, we distinguish four different roles of the individuals involved: social lab participants, case owners, social lab managers, and facilitators. Social lab participants are stakeholders and experts that provide their ideas, experiences, visions, concepts, and feedback to the lab process. The participants are responsible for the development, testing, evaluation and re-design of interventions addressing the social challenge at hand.

Interventions are tested in the real-life context of actual cases that are representative of the social challenge being tackled by the social lab. The embeddedness in the context in which an intervention is tested and implemented, and the commitment from the actors in that context, are critical for success. Social labs, therefore, include one or more dedicated
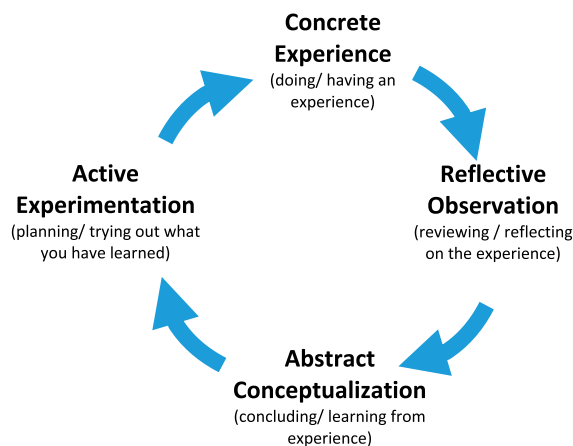

Figure 1. Experiential learning cycle. Source: Moon (2004).

participants called case owners, who are committed to introducing and testing an intervention within the context they represent. Depending on the social challenge, case owners, for example, come from universities, non-university research organizations, industry and SMEs, research funding organizations, CSOs, policy-makers or other organizations.

Apart from participants and case owners, which are involved in the actual lab process itself, there are two roles that specifically are geared towards the running of a social lab. The organizing and management of a social lab are the duty of a social lab manager. The social lab manager is a non-participant who is responsible for maintaining the social labs during its lifetime, to stimulate discussion and to ensure that work in the social lab is effective and efficient. The manager continuously evaluates the processes and outcomes of the social labs and will adapt processes accordingly. To this end, managers use face-to-face and online meetings, surveys, blogs, and emails for information and exchange. The social lab manager is critical to linking content and processes within the social labs. In addition, managers support case owners to embed, test, and implement an intervention in their social context.

Operationally the social lab manager is supported by a social lab facilitator, in planning and running workshops as well as focus groups or conducting the on-site experiments. Facilitators, therefore, must be acquainted with the social innovation process at hand, experiential and mutual learning, and co-creative group processes.

Action research

To provide theoretical grounding for the overall social lab process, Hassan builds on the so-called Theory U, which he consistently deploys throughout his book (Hassan 2014) and related field-book (Hassan 2015). Theory U is a 'spiritual', 'holistic' change management methodology first introduced by Otto Scharmer for dealing with emerging complex challenges (Scharmer 2009). Despite its name, Theory U is not a scientific theory as it lacks empirical evidence or conceptual grounding. It is therefore left out of this discussion.

In a similar vein, Kieboom, Sigaloff, and van Exel (2015) refer to two theories that underlie their narrative-approach to social labs, termed the 'feed forward' methodology. Kieboom et al. allude to action research in order to substantiate the process of generating, organizing and interpreting stories by social lab participants, which 'together serves as feedback for undertaking action in the future' (Kieboom, Sigaloff, and van Exel 2015, 42). As opposed to Theory U, action research is an established research method and therefore conceptually and empirically grounded. However, although Kieboom et al. outline how 'feed forward' can be put to practice, they do not explain how action research is to be operationalized within their methodology.

Due to its characteristics, which are akin to the purpose and features of social labs, we agree with Kieboom et al. that action research is suited to ground the overall social lab process. Moreover, due to its clear research orientation, including action research in the grounding of our social lab approach, helps to remedy the lack of a research focus of the current conceptualizations of social labs.

First introduced by Kurt Lewin (1890–1947), over time action research has established itself as a (social) research methodology that combines rigorous investigation with practical application (Berg 2009; Bradbury-Huang 2010). It has been defined as 'a

participatory, democratic process concerned with developing practical knowing in the pursuit of worthwhile human purposes, grounded in a participatory worldview' (Reason and Bradbury 2001, 1). The characteristics of action research align closely with those of social labs. Similar to social labs (feature 3), to action research participation, engagement and collaboration of stakeholders are paramount (Berg 2009; Denscombe 2010). However, unlike in social labs, action research makes a clear distinction between researchers (outsiders) as experts in theoretical knowledge and the stakeholders (insiders) as problem owners and sources of practical knowledge (Somekh in: Given 2008). In conformity with features 3 and 4, in social labs the experts and stakeholders are treated on a par and fulfill the same role within the lab process.

Also, similar to social labs (feature 2), action research aims at tackling practical, real-world problems, for example, improving the situation of the participants (Berg 2009; Denscombe 2010; Yin 2011). To that end, research findings are fed back directly into the environments from which they are generated (Reason and Bradbury 2001; Ritchie and Lewis 2003). Furthermore, action research's orientation on action and seeking change ties in with social lab features 2 and 5, although unlike social labs, action research may not necessarily aim for systemic change. Lastly, the process of action research proceeds in 'spiraling steps […] each of which is composed of some type of planning, action and evaluation' (Berg 2009, 248). This aligns closely with the agile and iterative nature of social labs (feature 6) as well as with the experiential learning method discussed above.

The alignment between action research and social labs warrants the integration of action research elements into a social lab approach. This is desirable because of the distinctive characteristics of each of the two approaches complement each other. Combining the approaches, therefore, helps to strengthen them both.

Unlike the extant social lab approaches, action research treats research as an aim in and of itself, rather than (merely) as a means to tackle practical (social) challenges. Therefore, by incorporating action research into our social lab approach enables us to further integrate research aspects into it such as theory formation (Gustavsen 2008). Moreover, due to its extensive use and development over the years, action research brings with it the (theoretical) rigor (e.g. Levin 2012; McNiff and Whitehead 2006) that current social lab approaches still are lacking.

In turn, the defining features of social labs allow remedying some of the known disadvantages of action research. First, in contrast to experimental research approaches, action research suffers from a lack of control over factors of relevance to the research (Denscombe 2010). By offering a bounded (lab) space for experimentation where interventions and solutions to be developed, tested and applied (feature 1), social labs enable overcoming this flaw thus strengthening the action research approach. Second, due to the partnership relationship between practitioner and researcher in an action research framework, ownership of the research process becomes contestable (Denscombe 2010). Because of its clear division of labor between lab participants and facilitators/ managers (discussed above), conducting action research in social lab supports overcoming this disadvantage.

So, due to these characteristics, action research is ideally suited to strengthen social labs ability to meet the dual aim of understanding and promoting emerging social phenomena such as RRI. In turn, conducting action research in a social lab setting helps to overcome some of its known disadvantages.

Conclusion

Emerging social phenomena such as RRI have to negotiate the paradoxical challenge of promoting an abstract ideal while it still lacks conceptual clarity and empirical evidenced and hence needs to be researched. In this paper, we proposed and went on to investigate and provide theoretical grounding for a social lab approach in which this circularity is utilized rather than avoided, as is the case in traditional research approaches. First, to deepen our understanding of emerging social phenomena, emergence of social phenomena was conceptualized as a hermeneutic process that involves going back and forth between mental images about what the social phenomenon should be of the subjects involved (for example, policymakers and RRI researchers), and ways it is being implemented in practice (for example, R&I practitioners and funding bodies). Next, we discussed the salient features of social labs which led to a preliminary methodological approach for social labs fit to deal with the hermeneutic nature of emerging phenomena and hence capable of dealing with the problem of circularity.

In order to meet the dual aim of promoting and understanding a social phenomenon such as RRI, the social lab approach requires theoretical grounding. However, the social lab approaches that are included in our approach foremost conceive social labs as a practical tool without offering a proper theoretical embedding. In order to remedy this, the paper went on to discuss the integration of theories of mutual and experiential learning and action research into a social lab approach. By introducing established theoretical approaches into our social lab approach, we provided further grounding for the defining features of social labs. Moreover, it allowed strengthening the research aspect of social labs that was largely missing from extant approaches, which were more practice-oriented. The framework thus constructed, on the one hand, provides a theoretical embedding of social labs, and on the other hand, overcomes some of the known limitations of the constitutive approaches (such as action research).

To follow up on the theoretical work in this paper, it is recommended to empirically test the social lab approach developed here in practice. This will allow to further develop it and to ground it empirically. More in particular, research should focus on 'what' constitutes a social lab and 'how' it can be implemented, i.e. test the selection and integration of social lab features, how best to operationalize them, and what possible barriers and enablers affect the functioning of social labs. And, on 'who' should be included, i.e. what stakeholders and experts to include in a (particular) social lab. To this end, a dedicated empirical test protocol needs to be developed that includes questions and approaches that allow to systematically gather evidence for the functioning of the six social lab features with respect to the four steps of the experiential learning cycle in the context of policy-making. Moreover, dedicated RRI projects such as RiConfigure (2018) where the social lab approach is being employed may provide appropriate testbeds. However, it is also recommended to extend the application of the approach to the research and promoting of other emerging social phenomena such as sustainable development and social innovation. Comparing the fields of application, in turn, could further our understanding of the construction of emerging social phenomena itself.

Note

1. Social innovation itself is a contested concept. It can refer to using innovation to tackle social challenges and/or to including stakeholders in the innovation process. Although partly overlaps with the concept of social labs and has been inferred as a method that can be used in social labs, it is a distinct concept. Because of its focus on innovation, social innovation is more akin to traditional labs that focus on design and technology than to social labs that have social problems as their object.

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