

Introduction: Living Labs Under Construction

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Abstract

Living Labs galore. Involving citizens and other stakeholders in science endeavors and integrating them in the design of new technologies and scientific inquiry is a core aim of contemporary research and development. Living labs are prime places in the quest of science to be more inclusive and to open up to people from all walks of life, including politics, design, and culture. Promising to foster participation, collaboration and co-creation around science, living labs have been mushrooming across the academe, from STEM subjects to the humanities. In fact, they have become the token for an up-to-date science communication that is not satisfied with conveying expert information but seeks an exchange with people that are addressed as the participants of, not just the audience for research. That said, it is also in living labs where the tension between the normative axioms and the precarious implementation of participatory science become succinctly apparent.

Keywords

Public engagement with science and technology

DOI

<https://doi.org/10.22323/2.22030501>

Submitted: 31st May 2023

Accepted: 5th June 2023

Published: 20th June 2023

Introduction

Living Labs were conceived in the early 2000s as both a method and a device to capture in vivo needs, expectations, routines, and barriers of different stakeholders [Greve, De Vita, Leminen & Westerlund, 2021; Leminen & Westerlund, 2019]. Living labs are considered a format of participatory research as well as of collaborative technology and product development that creates and makes observable situations deemed similar to everyday life. But despite the enthusiasm for living labs, the growing attention and financial allocation, there is a lack of consensus on what may be considered a successful implementation of a living lab, its mode of operation, activities and claims. So far, there is an abundance of attempts to define living labs, but no binding standards and no methodological anchoring [Følstad, 2008; Schuurman, De Marez & Ballon, 2015].

Therefore, despite the keen interest and heavy investments into living labs, their epistemic underpinnings and conceptual grounding remain shaky. The many

approaches and initiates, that are for instance connected in the European Network of Living Labs (ENoLL), do not follow a common idea or design, except the ambition to venture into the “real world” [ENoLL, 2022]. Moreover, little is known about the communicative and social processes happening at these sites and the ways participation is being configured. What is further missing is a critical view on the schemes and ambitions around public engagement and living labs which have been the focus of funding, especially in Europe, since 2006. The fact that living labs have not yet been researched in depth, nor that empirically supported guidelines for their establishment and maintenance exist, is a serious gap in science communication research. It becomes even more obvious and its closure more urgent in view of science policy efforts to pursue more intensive participatory science and science communication.

Studying Living Labs

The concept of “living labs” is enormously popular [Wershler, Emerson & Parikka, 2022]. Regardless of which idea living labs follow, the basic principle is the participatory involvement of stakeholder groups who are supposed to be different and more diverse than the actors usually employed or addressed in R&D projects. In essence, the aim is to create or use environments that are as “lifelike” as possible, in which people interact with new technologies and take an active role in innovation and design processes [Ogonowski, Ley, Hess, Wan & Wulf, 2013]. Accordingly, parallels with co-design, participatory design, and co-creation are close, with living labs being used in scientific as well as civic and industrial contexts. However, there is a lack of methodological foundation and scant reflection of the design and evaluation of participatory, user-centered approaches [Dalsgaard, Halskov & Iversen, 2016; Dutilleul, Birrer & Mensink, 2010]. These desiderata are, we argue, linked to four central problem areas that affect both the practice and the study of participatory science communication in living labs.

The first problem is insufficient user participation. In principle, participation reaches from the test-setting and usability trials of market-ready applications up to open-ended processes in which participants already take part in the brainstorming and development stages of an innovation or are involved in research concerns at an early stage. In the European open innovation context, living labs are often discussed as evaluation environments involving hundreds and thousands of informants, while co-design contexts emphasize more the local embedding and focus on smaller real groups of users and designers [Vanmeerbeek, Vigneron, Delvenne, Rosskamp & Antoine, 2015]. However, comparative studies show that actual co-design, i.e., an open-ended and early involvement of users in the innovation process and a mutual learning and interaction process between participants and facilitators, is formulated as a goal, but hardly ever actually achieved [Vanmeerbeek et al., 2015]. Interactions in living labs are numerous but mostly superficial, while broader participation is rarely achieved [Mulvena et al., 2011].

Second, living labs, especially in industrial and scientific contexts, predominantly target members of a technology-interested, educated, and White male creative class [Ames et al., 2014; Halskov & Hansen, 2015; Harrington, Erete & Piper, 2019]. There is a claim to enable participation of broad civil society and vulnerable stakeholder groups — but this de facto rarely happens. In particular, people whose sociodemographic and cultural backgrounds differ from those of the operators are

mostly poorly represented and miscast as a homogeneous, often deficient group [Vines, Clarke, Wright, McCarthy & Olivier, 2013]. The initiated sociotechnical innovation process is also often subject to an “innovation bias” [Greenhalgh, 2013], i.e., a one-sided preference for technological solutions over addressing social or cultural challenges. This innovation bias and the demographics of living labs create a skewed representation of societal stakeholders and needs — attention is paid to living lab-affine groups as well as secondary users (e.g., caregivers, not those in need of care) who may not be congruent with targeted end users [Cardullo, Kitchin & Di Feliciano, 2017]. However, the ability of participants to influence the process itself and, more importantly, the definition of the problem to be solved and the solution sought, is critical for consistent participation. Defining and reaching out to reference groups is thus a normative and political moment of participatory science [Vines et al., 2013].

Third, the mere attribute “participatory” obscures indispensable coordination processes and decisions to involve and activate people [Vines et al., 2013]. It leaves out the specification of topics and methods, the synthesis of contributions and processes, and the making of decisions. The multitude of requirements runs counter to the ideal of maximal participation in which the interests, and concerns of stakeholders are prioritized. The promise of living labs to be open to topics, procedures and results requires forms of organization and coordination yet previous conceptions as well as scientific engagement with living labs miss the parameters under which these arenas of participatory science engagement and co-creation could operate. The same is true for the insufficiently defined roles of those running and initiating living labs.

Fourth, there is a lack of discussion of the conditions of active participation, which is mostly taken for granted. Even if participants are given the chance to influence the processes and outcomes of brainstorming, design and development, it remains unclear to what extent this outweighs the individual effort and can address the open question of who actually benefits from participation and in what way [Iversen, Halskov & Leong, 2010]. Thus, little attention is paid to the interests of those to be involved; even the success of living labs is mostly determined starting from the goals of the operators and sponsors, e.g., prototyping designs and iteratively optimizing technical products [Bratteteig & Wagner, 2016]. This not only overlooks the stakeholder groups that participatory approaches are supposed to focus on, but it is also questionable to what extent living labs can generate sustainable participation.

About this Special Issue

This special issue of JCOM addresses the lack of conceptualization and rigorous analysis of the paradigmatic foundations and practical frameworks of living labs. Unlike other publications on living labs, this special issue is not bound to a particular area of application but rather focuses on the communication and interaction happening there. It is interested in contributions that examine the ways living labs are constructed and operated so to fulfil the promise of open, active, and innovative public science engagement. Its articles query the underlying theories and normative assumptions of living labs, for instance regarding the varying notions of what makes for “productive” participation and “good” participants; it also involves thinking about other factors such as trust, agency, and expertise that come to bear upon the living lab experience. We also invited pieces that present

and discuss methods for studying the public engagement and public participation aspects of living labs and what kinds of insights they help to generate.

This special issue furthermore provides a space to interrogate the key moments in the life cycle of living labs like the definition of problems and possible solutions, the identification of stakeholders and their needs, or the organization of their temporal order and social responsibilities. In particular, we have encouraged articles that take a comparative look at the public science communication aspects of living labs in different scientific or societal contexts.

Along these topics, this special issue allows us to scrutinize the merits and pitfalls of an omnipresent science communication enterprise. It makes us rethink and reorganize how living labs are set up and operated, and define standards for what constitutes successful and sustainable integration and public engagement with science. We have invited research articles as well as practice insights and essays that fall within the scope of JCOM.

In their contribution, Loes Witteveen, Jan Fliervoet, Dwina Roosmini, Paul van Eijk and Nurdahlia Lairing propose to a threefold framework to look at and compare living labs. The first dimension examines the environment of living labs, their material setup and situation as well as the characteristic focus. Second, they propose to turn to the activities and methods championed in a living lab, and third, they zoom in on the outcomes of a living lab. What is more, the authors stress that these are not stable elements but form part of a dynamic lifecycle. This complex framework is then applied to four living labs in Indonesia and the Netherlands.

In “Living labs contributions to smart cities from a quadruple-helix perspective,” Daniel Esashika, Gilmar Masiero, and Yohann Mauger explore the influence of living labs in smart cities. Applying a quadruple-helix model which focuses on government, industry, academia and the public as key stakeholders, they investigate knowledge production and diffusion within innovative ecosystems. The authors identify a crucial challenge: incorporating stakeholders in smart city project design and governance to balance its technological, political, and participatory elements. The study, focusing on three Brazilian living labs, employs semi-structured interviews with organizers and participants. The researchers highlight the significance of training and collaborative events within living labs, often overlooked in their traditional role as technology design/testing spaces. Their analysis reconstructs the interaction between the four stakeholder groups, and shows that events held in living labs are vital for connecting participants with other local actors. Furthermore, they reveal a significant discrepancy between the theoretical and actual roles participants play in these projects.

The contribution of Madlen Günther, Simone Martinetz, Josef F. Krems, and Bernd Bienzeisler provides a practical insight into a project to promote sustainable mobility conducted in Chemnitz, Germany, from 2019 to 2022. Within this context, “Living Lab” is understood as an experimental field on the periphery of the city. Following the requirements of the citizen-oriented approach of the study, the authors investigate three participation formats — on-site, direct mail, and online — which are compared regarding their influence on willingness to participate. Additionally, the evaluation tries to find predictors for participation satisfaction as well as for the impact of participation on the acceptance of urban transformation processes. The paper too deals with a matter of some concern for

living labs as well as science communication in general. That is, how to reach not only already affine groups? This question seems to be even more important given the fact that Günther et al. show the positive influence of participation on acceptance, satisfaction, and behavioral intentions regarding urban transformation.

In “Co-Creativity in Living Labs: fostering parallel and Phygital co-learning and co-creation processes to transform food systems,” Sonia Massari, Dalia Mattioni, Francesca Galli, and Yuna Chiffolleau scrutinize the role of collaborative creativity, or “cocreativity”, within living lab research in agri-food systems. They question if creativity is fostered or undervalued in co-creation processes, and how it can be effectively monitored and measured. The authors suggest that the lack of emphasis on creativity in primary research settings could reflect a history of living labs prioritizing tangible outcomes, objectivity, and replicability. The study includes an analysis of different interpretations of the relationship between co-creation, co-production, and co-design. Through a case study in the food sector, they illuminate how co-creative activities require a balance of divergent and convergent processes of collaborative creativity, stressing that such collaboration must be carefully guided. They argue that collaborative learning is vital for the growth and maturity of living labs and propose it as a key topic for future research.

In their research article, Kit Braybrooke, Gaoli Xiao, and Ava Lynam describe and evaluate a new method they developed during the COVID-19 pandemic to share impressions of socio-spatial practices in Living Labs: participants exchanged photos and insights on WeChat about their everyday experiences in urban-rural Living Labs in China and Germany. The authors reflect critically on the limitations, biases and ethics of the method and “translate” them into generic design principles for future studies.

Adalberto Fernandes focusses on living labs as “facilities for prototyping and testing technologies”. Visual models being used in these contexts, he argues, often manifest existing power structures and predefined procedures. This becomes even more acute when interests of industrial stakeholders are involved. Based on an exploratory political-semiotic analysis, the author notes a common understanding of participants as “end-users” involved in a rather linear process of designing technology which ignores the power of dissensus, especially within political processes. Ultimately, Fernandes pleads for a cautious differentiation between industry-driven development and serious participatory approaches taking into account their particular strengths.

Another form of critique is offered by Dara Ivanova and Sabrina Huizenga who take issue with the strategic configuration of urban living labs. Discussing their experiences with urban living labs in Rotterdam they treat these spaces as “ontological objects” which not only invite the production of knowledge. On the contrary, the researchers found them to be the element of purposive “myth-making” that also worked to exclude certain groups of people.

Looking back at 4+ years of running a living lab, Christian Pentzold, Ingmar Rothe, and Andreas Bischof reflect on ideals of participation and inclusivity that undergird many living lab enterprises and place them in discourses around a public engagement with science, participatory design, and co-creation. Realizing such ambitious scheme is, they argue, challenging since it ultimately requires a

kind of empowering hospitality and an ongoing commitment to social infrastructuring.

Finally, Andreas Hepp sets out from the observation that there is a widespread fascination with labs as places of experimentation and tinkering. As such, labs seem a pervasive form of organizing and locating not only scientific practice but technological and social endeavors. Following Hepp, the lab forms one such pertinent sort of everyday experimentation, next to the “space” (as in Makerspace or Hackerspace), and the meetup. They provide the habitat for pioneer communities that not only try new technologies but also probe new forms of social collaboration.

Acknowledgments Funded by the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) — Project-ID 4162288727 — SFB 1410).

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How to cite

Wehrmann, C., Pentzold, C., Rothe, I. and Bischof, A. (2023). 'Introduction: Living Labs Under Construction'. *JCOM* 22 (03), E. <https://doi.org/10.22323/2.22030501>.



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